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Progress in Maternal and Child Welfare Under the Social Security Act*

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EIGHT months have elapsed since the passage of the supplemental appropriation act making available funds for grants to states authorized under the Social Security Act of August, 1935. It is appropriate that a report of progress should be given at this time to the Child Hygiene Section of the American Public Health Association with regard to the activities under those parts of the act that have to do with maternal and child health, crippled children, and child welfare, as outlined in the provisions of the first 3 parts of Title V of the act and as administered by the Children's Bureau. The provisions of the act with respect to maternal and child health and services for crippled children I can assume are known to this audience; those that have to do with child welfare are probably less well known and their purpose and scope and the correlation of this program with the other 2 will be referred to briefly.

In all 3 parts of the title preventive services are stressed. The maternal and child health program is entirely a preventive one; in the crippled children's program, though medical and surgical care and hospitalization of crippled children are the chief services rendered, nevertheless, care of children suffering from conditions that may lead to crippling is specifically authorized in the act, and such preventive services are actually being rendered at this time in a number of states, notably in Mississippi, Alabama, and Tennessee, where the recent epidemic of poliomyelitis has occurred. In the child welfare program attention is being directed toward the prevention and amelioration of those social and economic conditions that lead to maladjustment of the individual child in his relation to family and community. The act permits the state public welfare departments in coöperation with the Children's Bureau to make grants to local communities in order to pay part of the cost of services for dependent, neglected, and homeless children, and children in danger of becoming delinquent, with the pur-

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pose of providing for children living in the rural and semi-rural areas the type of care that has been available for these socially handicapped children in larger cities for many years.

During the past 8 months rapid progress has been made by the states in establishing these 3 programs. On the map in Figure I will be seen the status of each state and territory and the District of Columbia on October 15 of this year. Symbols show whether plans for maternal and child health, for crippled children, or for child welfare services have been submitted to and approved by the Children's Bureau.

During the 5 months ending June 30, plans submitted by 46 states, Hawaii, Alaska, and the District of Columbia for maternal and child health services for the fiscal year 1936 were approved by the Children's Bureau. One additional plan has been approved for 1937 and it now appears that the last of the 51 will very soon be approved.* One state with an approved plan for 1936 has not yet submitted a plan for 1937. The rapidity with which the maternal and child health programs have been developed has been due in no small part to the experience gained by the states as a result of the administration of the Maternity and Infancy Act from 1921 to 1929.

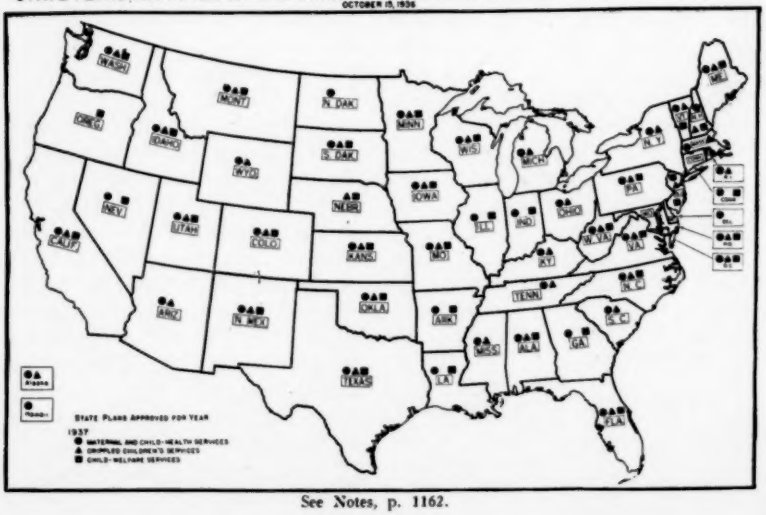
Plans for services for crippled children were submitted by 44 states before June 30 and 38 of these were approved by the Children's Bureau. When approval was withheld, the reason was in all cases one involving the question of the authority of the state agency submitting the plan to assume under the state law final administrative control over all parts of the program as required by the federal act. Since July 1, 2 additional plans have been approved and 4 others are being studied from a legal and administrative point of view to determine whether or not legislative action will be necessary before approval can be given. Seven states have not yet submitted plans. The difficulty in some cases is a question of legal authority; in others one

* Approval has been given to this state's plan since this paper was read.

FIGURE I

STATE PLANS APPROVED BY U. S. CHILDREN'S BUREAU, TITLE V, SOCIAL SECURITY ACT

OCTOBER 15, 1936



See Notes, p. 1162.

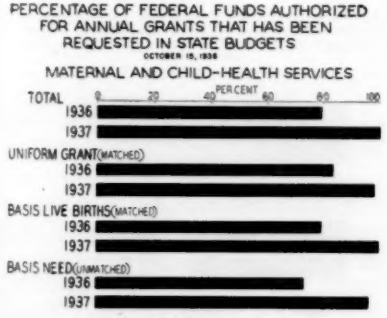
of financial participation by the state.

Plans for child welfare services were submitted by 40 states before June 30, and payments under approved plans were made to 34. Since the beginning of the new fiscal year 7 additional state plans have been approved and 1 other has been submitted and is awaiting approval. In these programs, as in those for crippled children, some states have not had an official agency in a position to coöperate. Inasmuch as the legislature in nearly all states will meet in regular session in 1937, it is expected that practically every state will be coöperating in all 3 programs by the end of the current fiscal year.

The Social Security Act authorizes annual grants to states for maternal and child health in the amount of $3,800,000; for crippled children in the amount of $2,850,000; and for child welfare in the amount of $1,500,000. Figures II, III, and IV give the proportion of each of these funds that was requested by the states and territories submitting plans for the 5 months ending June 30, 1936, and also for the fiscal year 1937. The total amount for maternal and child health is shown divided into its component parts as outlined in the act, the amount granted as uniform allotments of $20,000 to each state, the amount granted on the basis of live births (both of which must be matched by the states), and the amount granted on the basis of the financial need of the states for carrying out their state plans. During the 5 month period ending June 30 plans and programs were in a preliminary stage of development; information with respect to available matching funds was not always complete; the inclination to limit new work until a sound policy of expansion was established was nearly universal. As a result, a smaller proportion of available federal funds was requested for 1936 than has since been requested for the year 1937. That this development should have been relatively slow is, of course, desirable.

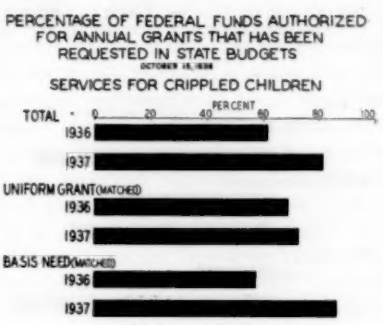
Figure III shows the proportion of authorized grants requested by the states in 1936 and 1937 for services to crippled children. Again, the total amount has been divided as outlined in the act, into that granted as uniform allotments of $20,000 to each state and that granted on the basis of the need of the state as shown by the estimated number of crippled children and the cost of care. Here, too, the proposed plans for 1937 call for a larger proportion of available federal funds than did the plans for 1936. Figure IV shows

FIGURE II



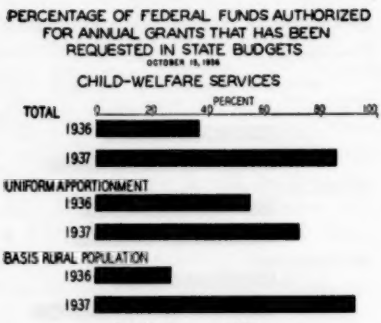
See Notes, p. 1162.

FIGURE III



See Notes, p. 1162.

FIGURE IV



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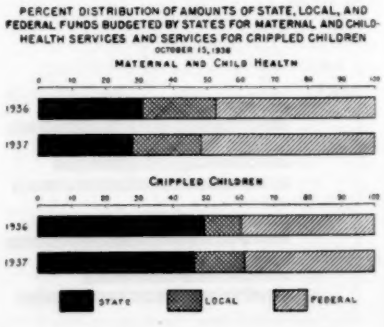
proportion of authorized grants for child welfare services. These also have been divided, one amount being granted as uniform allotments of $10,000 to each state, the other on the basis of rural population. The rapid progress that has been made in establishing this almost wholly new program is evident.

Further analysis of the budgets for maternal and child health and for crippled children submitted by the states to the Children's Bureau for both 1936 and 1937 shows additional facts that are of interest. In each case the budgets submitted give the cost of the total proposed plan and the amounts to be charged to state, local, and federal funds. The per cent distribution of the amounts charged to each of these funds for the fiscal years 1936 and 1937 has been computed for the total group of states coöperating and is shown in Figure V. The large proportion of state funds appropriated for work with crippled children is in marked contrast to that for maternal and child health, and indicates a strong tendency for centralization of the crippled children's program in the state agency. There is, however, some indication that the amount of local participation is increasing. Together state and local funds for crippled children far exceed federal funds. This excess is apparently accounted for by a large excess of state funds in a small number of states where work for crippled children has been highly organized in the past and where state and local appropriations have been substantial over a period of years. It should be pointed out, however, that of the 44 states submitting plans for crippled children, 5 have not appropriated or set aside enough funds in 1937 to match even the uniform grant of $20,000. The increase in the proportion of federal funds budgeted for maternal and child health for 1937 as contrasted with 1936 is due not to a decrease in state and local funds used for matching but to requests for increased allotments from the unmatched fund that is granted on the basis of need of the state to carry out its state plan. Again, 5 states have not appropriated or set aside enough to match the uniform grant of $20,000 for maternal and child health.

More detailed study has been made of the estimated expenditures as budgeted by the states for the 5 months ending June 30, 1936. Of the total amount provided for maternal and child health, nearly 20 per cent was budgeted for the services of physicians, either as full-time administrators or as part-time assistants in health conferences or in postgraduate teaching; 38 per

FIGURE V



cent was budgeted for public health nurses; 5 per cent for dental, nutrition, and health education services; 6 per cent for clerical assistance including some for vital statistics; 16 per cent for travel for state and local staff; and 15 per cent for biological supplies, equipment, printing, and other incidental expenditures. Nearly 80 per cent of the total is being spent for actual service for mothers and children. Apparently federal funds are being used by the states to build up the maternal and child health program by providing full-time physicians to give medical leadership to the program, part-time physicians for conferences and clinics, special consultants and instructors in pediatrics, obstetrics, nutrition, and health education, supervisory public health nurses and many staff public health nurses. Actually half the cost of the services of physicians administering the maternal and child health program and of the specialized public health nursing supervisors was charged by the states to federal funds in the 1936 budgets. An even larger proportion of the expenditures planned for medical, nutrition, and health education specialists, and for instructors in pediatrics and obstetrics is being charged to federal funds, reaching more than 90 per cent in the case of special consultants, instructors, and members of advisory committees. On the other hand, slightly more than half of the cost of dental services and staff nurses, and considerably more than half the cost of clerical services, supplies, and incidental expenditures is being borne by state and local funds. Similar figures for 1937 are not yet available for comparison with 1936.

Study of the detailed budgets for the crippled children's program for the 5 months ending June 30 shows a quite different picture, as would be expected from the terms of the Social Security Act. Funds for state-wide administration and for services of full-time personnel constitute only 11 per cent of the total state, local, and federal funds included in the plans of 38 states; 81 per cent was budgeted for hospitalization, surgical and medical costs, and costs of appliances. Other expenditures, including supplies and equipment and also travel, largely for state staff, made up the remainder. If the provisions of the act that have to do with the establishment of state-wide services for crippled children, and especially those that have to do with after-care are to be carried out adequately, it is likely that there will be increased allotment of funds for administration and field personnel and a proportionate decrease in allotments for surgical services. Obviously, the best operative procedure may be wasted if follow-up care by nurses, physiotherapists, physicians, and social workers is inadequate.

Considering the short time that funds have been available and the nature of the requirements of the act, the progress made by the states in planning and in the administrative aspects of the program has been, on the whole, satisfactory.

But what about actual programs and the progress made in the establishment of new services or the extension of old programs? The Social Security Act requires that maternal and child health services shall be extended to local communities and administered by them. Reports of progress made during the first 5 months of the program were submitted to the Children's Bureau by 47 states in July and August of this year and show some striking evidences of the initiation of new work. In 208 counties, 77 towns, and 11 health districts, new maternal and child health services were put into operation before June 30 and expansion of service was reported from 167 additional counties,

42 towns, and 16 health districts, making a total of 521 local communities with improved maternal and child health service in the first 5 months of the program. Among these have been listed the placement of public health nurses in full-time county health units and in unorganized communities; the organization of maternal, infant, and preschool health conferences and centers under medical and nursing supervision; the institution of maternity nursing services; venereal disease control among pregnant women and children with congenital syphilis; midwife instruction and supervision; nutrition services; school health examinations; immunization programs; and dental hygiene programs. In 20 states plans for the "demonstration services in needy areas and for groups in special need" that are required under the act had reached the point where they could be put into actual operation before June 30; in 4 additional states the programs were ready for operation on July 1.

With respect to the plans for these demonstrations much could be said would time permit. It should be pointed out, however, that maternal care is the major objective of 31 such demonstrations described in the 1937 plans and part of a joint maternal and child health program in 18 others. Plans for the establishment of maternity nursing service at delivery for women living in rural communities have been reported by more than 20 states and in a few the plan includes provision for medical care as well as nursing. It is hoped that through these demonstrations there will be developed methods which are of sufficient practical value that many rural communities will be able to use them or adapt them to special needs. The emphasis that has thus been placed on the need for more adequate and more complete maternity service by physicians and nurses bodes well for improvement in service and the reduction of mortality rates, not only maternal rates, but also neonatal and fetal.

The state plans indicate clearly that improvement in maternity services and in the care of the new-born infant is generally believed to be a matter of professional and lay education, and that the responsibility for effective programs must be borne by clinicians and public health administrators working together. Professional education for physicians and nurses is a part of the proposed maternal and child health program in a majority of the states. The plans include short postgraduate courses or institutes in obstetrics or pediatrics for practising physicians, special postgraduate courses for physicians administering the maternal and child health programs, continuous staff education for public health nurses, and additional training for nurses who are to be specialized supervisors in this field.

The progress reports from the states showed that during the 5 months ending June 30, 13 states inaugurated postgraduate work for physicians in obstetrics and pediatrics, and 8 started postgraduate work for nurses. Altogether during this initial period, 65 nurses, 21 dentists, and 8 physicians received special training in some phase of the program. Coöperation between the state and county health departments and the state and county medical societies in the inauguration and carrying out of the postgraduate courses for physicians is described in all state plans including such courses as part of their program. Furthermore, in all approved state plans there appears evidence of actual coöperative planning by the health authorities with medical, nursing, and welfare groups and organizations, or of proposed coöperative activities to be carried out as the plans progress.

With respect to progress under plans for crippled children, information is somewhat more limited, largely on account of the fact that in many states the program is new and the development of plans necessarily slow. However, some information as to expansion of services is available. Progress can be measured in part by the strengthening of the state administrative staff and the staff needed for state-wide services for locating crippled children and for their after-care, a phase of the work that has been neglected in many programs in the past. During the first 5 months a total of 122 new full-time staff members were appointed by 33 states. This number includes 15 full-time physicians as administrators, 33 orthopedic nurses, 10 physical therapists, 17 social workers, 6 workers described as supervisors, and 41 clerical assistants. Many other such workers are planned for and the positions will be filled as qualified candidates are found. A large number of surgeons or physicians are assisting in the diagnostic clinics and in operative work on a part-time or a fee schedule basis.

Though in many states the period of operation of plans in the last fiscal year was very short, diagnostic clinics were reported to have been held in 7 states where the service is entirely new and from 11 other states reports were received showing expansion of this type of service into a number of the more remote areas not previously reached. Hospital facilities were increased or established for the first time in a number of states; facilities for convalescent care have been increased in only a few so far. Follow-up service and after-care by nurses and social workers is being augmented rapidly, but no figures are available with regard to the scope of these services. An excellent beginning has been made, however, in many states with respect to strengthening the central administrative staff and the field service, and the extent of the coöperative activities carried on by crippled children's agencies with medical organizations and with public health, public welfare, and vocational rehabilitation agencies is most encouraging.

In the program for child welfare, definite progress is being made in all of the states coöperating with the Children's Bureau. In 308 counties or districts (in 4 states districts are composed of several towns), child welfare services have been put into operation with the use of federal funds, supplemented by the localities. Workers attached to the state welfare departments are providing some case work and general child welfare service in 192 additional counties in order to demonstrate the necessity for more extensive work in individual counties. Local staff provided through federal funds to assist county welfare departments includes 271 social service workers. In addition 133 full-time workers have been employed by the state welfare departments for assisting local units and organizing state-wide activities, and 96 additional workers have been employed part-time by state welfare departments for carrying on the same program. In the field of child welfare, as in those of maternal and child health and crippled children, a shortage of well trained workers with experience in the special field delays and handicaps the program.

On the whole, the progress made in these various programs for the health and welfare of children is most encouraging. The figures just reported are based on the first 5 months only. Much more new work that was planned during the earlier months is now being put into operation. As the plans go forward, however, it becomes more and more evident that a preventive program, whether in the health or social welfare field, that is not supported by adequate facilities for correction of

handicapping defects or for the care of the more serious illnesses and maladjustments and is without resources to provide adequate food, shelter, and clothing, is itself seriously handicapped. Physicians may offer the best type of health supervision to mothers and children in conference or office, but unless facilities for adequate maternity care at delivery or for correction of the physical defects of children, or for their care during illness, are available to all, including those unable to pay for these services, the value of the health supervision given may be to a great extent lost.

A public health nurse can go only a certain distance in her maternal and child health program without adequate medical support, sufficient economic resources, and the assistance of social case workers for special problems. A child welfare worker must have at her command certain facilities to aid in the handling of children with serious social maladjustments. Treatment must be instituted quite as much for this socially handicapped child as for the physically handicapped, and knowledge and understanding of social causes and skill in handling the procedures of treatment are as essential for social adjustment as is medical skill and nursing in caring for the physically sick.

The need for correlated action by workers in the fields of health and social welfare becomes more and more evident as progress is made in the establishment of the basic services under the Social Security Act. Opportunity for demonstration of the effect of combined medical care and social treatment is made possible under the section of the act providing services for crippled children; opportunity for correlation of the health and social services for children living in rural areas will be increasingly possible as the establishment of county-wide programs of child welfare and child health provides the mechanism for this coördination.

The maternal and child welfare services are but a part of the total program for social security. The basic economic provisions of the act and of the whole relief program as well as the provisions for general public health and for aid to dependent children lay the foundation on which the special health and welfare services to mothers and children can be built. The need to focus attention on the child and his needs as a growing and developing individual must nevertheless still be of major concern in all our planning in the field of social welfare.

NOTES

FIGURE I—Since this map was prepared the following plans have been approved: maternal and child health services, Oregon; services for crippled children, Hawaii; child welfare services, Arizona, Delaware, Massachusetts, Michigan, North Dakota, and Ohio.

FIGURE II—This chart is based on requests from 47 states, Alaska, Hawaii, and the District of Columbia, as of October 15, 1936. Though a few states were not able to match in full the allotment for maternal and child health services for the fiscal year 1937, the total amount requested by the states for 1937 actually exceeded by $22,166.59 the $3,800,000 authorized for annual grants because certain states were able to match part of the funds carried over as balance from 1936.

FIGURE III—This chart is based on requests from 38 states, Alaska, and the District of Columbia. A few states were not able to match in full the allotment for crippled children for the fiscal year 1937; others were able to match the full amount for 1937; and still others the full amount for 1937 and also part of the funds carried over as a balance from 1936. It is anticipated that at least the full amount authorized on an annual basis will be requested before the end of the present fiscal year.

FIGURE IV—This chart is based on requests from 36 states and the District of Columbia.

Immunity to Virus Diseases*

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TO understand thoroughly the mechanism of immunity to infection it would be necessary to know the factors concerned in the phenomena of susceptibility and invasion of the host; that is, the phenomena of pathogenesis. Unfortunately, at the present time knowledge of the pathogenesis of many infectious diseases does not rest upon a scientific foundation, and there is necessarily much empiricism in attempts to combat them. If you will look through the voluminous literature on the subject of immunity you will find a great deal about phagocytosis and antibodies and complement in general, but you are likely to look in vain for a scientific explanation of an acquired resistance to any specific infectious agent. Take the common disease typhoid fever for an instance. After the typhoid bacillus enters the mouth, knowledge of its adventures in the host which terminate in typhoid fever, practically ceases; and although vaccination by the introduction of dead typhoid bacilli seems to induce a limited resistance to subsequent infection, it is not known how this is, nor the reason for the more substantial immunity which follows recovery from an attack of the disease. Did we understand more thoroughly the pathogenesis of typhoid fever it is possible that even better means of inducing resistance would become available.

So it is with immunity to virus diseases. It is a very encouraging fact to those who are concerned with problems of prophylaxis that most virus infections leave the recovered patient solidly immune to a recurrence of the disease. Sooner or later we shall know how this is brought about, it is to be hoped. Then we should be able to protect without inducing disease.

There is, no doubt, a long chain of reactions between the infectious agent and the host, which leads to disease and to immunity. The weakest link in this chain should be broken, and the weakest link may be a different one for each type of infection. At the present time we do not know all the links, and fact must be supplemented by hypothesis, so that further pertinent data may be acquired.

Let us enumerate briefly some of the facts concerning immunity to virus infection, for with them must be constructed the temporary scaffold of experimental hypothesis.

1. *Most virus diseases are followed by a protective immunity.* In some cases the immunity is lifelong, in a few instances it is relatively brief. Among the former are smallpox, measles, mumps, yellow fever, and perhaps poliomyelitis. In the latter group are the common cold and influenza, diseases probably caused by cytotropic viruses, and the common fever blister or herpes simplex.

* Read before the Epidemiology Section of the American Public Health Association at the Sixty-fifth Annual Meeting in New Orleans, La., October 20, 1936.

2. *Viruses act as though they are antigenic substances.* This is an obvious inference from the fact of specific immunity.

3. *Immunes may be carriers of virus for a considerable period of time* in the case of infection by at least some viruses. Instances of this event are better known in animal diseases, such as fowlpox and infectious anemia of horses, than in those of man. The idea however has been advanced that durable immunity in man may be due to residual virus following infection, or to repeated subinfections, although there is no very good evidence to support this view, as of general applicability.

4. *The degree of immunity to a specific virus* is variable, in the same individual and in different individuals.

5. *Individuals may become immune to certain viruses without having* suffered clinical *evidences of disease.* This occurs in the case of the poliomyelitic virus, and it has been explained on the assumption that repeated sub-clinical infections are responsible. There is however another important conception, namely, that cells may acquire an immunity, that is, become unsuitable media for a virus, from nonspecific causes, such as age, differentiation, state of nutrition and other such changes which alter cells. Should this be true, it seems possible that methods could be devised to utilize such nonspecific means of inducing resistance to certain virus infections.

6. *Treatment of susceptible tissue with chemicals may increase or decrease resistance to infection by some viruses.* Experimentally, such a procedure has proved effective in preventing nasal infection in monkeys by poliomyelitic virus. This result, however, is considered to be a blocking of a portal of entry, rather than an induction of an active immunity. What result this method may have in human prophylaxis remains to be seen.

7. *Subjects immune to a virus following infection usually contain specific neutralizing antibodies in their blood.* There is thus evidence of a humoral response to specific antigens present during virus infections.

8. *Prophylactic administration of serum of immunes may passively protect* for a relatively short time. Advantage of this fact has been taken in prophylaxis against measles, mumps, and canine distemper. Humoral antibodies evidently may prevent, under some circumstances, invasion by viruses.

9. *Administration of serum from an immune during the course of virus* infection is of little or no avail, and there seems to be no proven antitoxic effect.

10. *Recurrent attacks of a virus infection may take place in individuals whose blood contains neutralizing antibodies.* An example of this is to be seen in recurrent herpes simplex or fever blisters.

11. *Immunity to reinfection by a virus may occur before the active disease or lesion becomes quiescent or healed.* Warts and the salivary gland disease of guinea pigs are good illustrations. In such cases individual cells perhaps become immune more slowly than antibodies appear in the blood.

12. *Some viruses may be so modified by passage through an alien host that subsequent infection in an original host may be very mild, but sufficient to confer solid immunity to the virulent strain.* This of course is the basis of Jennerian vaccination, and the principle is now used in other instances such as the induction of active immunity to yellow fever by the use of mouse-brain virus.

13. *Inoculation of virus into an area not a natural portal of entry may lead to a mild infection followed by immunity.* In some instances, for example, immunity to poliomyelitis may follow intracutaneous inoculation of monkeys. But the method is not yet safe.

14. *There may be distinct antigenic strains of the same virus, which do not effectively immunize against each other.* For example the two or three strains of the virus of foot and mouth disease.

15. *In some instances in spite of the presence of specific neutralizing substances in the blood, there is little or no resistance to specific infection by a virus through natural channels.* This may be the case apparently in experimental poliomyelitis in monkeys. Rivers, Andrews, and others have demonstrated experimentally that certain living cells from normal or immune animals *in vitro* will permit growth of virus. But infection of these cells may be prevented by treatment with immune serum prior to but not after brief contact with active vaccinia or herpes virus.

16. *Administration of apparently noninfectious or killed virus as a vaccine usually does not result in protection.* If protection occurs under these circumstances it is questionable whether all virus activity was destroyed.

17. As a corollary it may be true *that all acquired immunity from the administration of virus vaccine results from active,* though *unrecognized, infection.*

Here then are a group of facts and inferences concerning immunity to virus diseases which at first glance seem to

be very confusing and to possess little analogy with other types of infection. In order to comprehend them intelligently and to deal with them experimentally in such a way that they may be useful, it is necessary to construct hypotheses into which these facts will reasonably fit. Only then may we utilize them to best advantage to forward experiment. It may be useful therefore to refer to some theoretical considerations which may be appropriate.

Infectious microörganisms reproduce themselves within the infected host under different conditions. For example, some grow only within the body fluids, some may grow either in the body fluids or within certain host cells. Still others seem to require the living protoplasm of the host's cells as a medium of growth. I have recently classified these groups as extracellular parasites, facultative intracellular parasites and obligate intracellular parasites.

It is not known whether viruses are living parasites or not, but all the knowledge we have of them indicates that they require, as do the obligate intracellular parasites, the environment of living cells of the host for their multiplication. They are therefore said to be cytotropic agents.

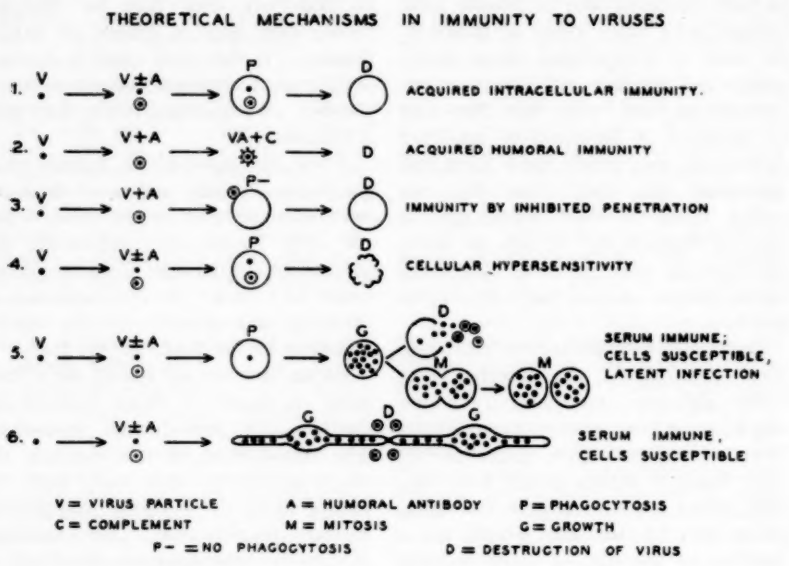
In order to emphasize the importance of an understanding of pathogenesis in relation to immunity let us contrast some of the theoretical possibilities with reference to the mechanisms of resistance to a group of parasites which invade and multiply in the fluids of the host, and the groups of viruses which seem to require the internal medium of living cells.

Let us consider acquired immunity to the extracellular bacteria first. The bacteria on entering the fluids of the host may become affected by opsonins or other antibodies, and be rendered more easily phagocytosed than normal. In this way they may be removed before they have a chance to induce disease. Or they may come in contact with lysin, be rendered soluble by complement, and destroyed before they gain a foothold.

These two possibilities, namely phagocytosis and the action of humoral antibodies, seem to be the chief, if not the only theoretical mechanisms for preventing infection in the actively immune host under the circumstances of invasion and growth of the microorganism in the fluids of the body.

As we have already stated, the viruses seem to require a living intracellular medium for reproducing themselves. The introduction of this element, the essential, living, host cell, into the pathogenesis of infection complicates matters considerably. For example, if virus is introduced into the fluids of a resistant host it may be either dissolved directly, or destroyed by phagocytosis, before it comes in contact with its required medium. If it does not reach susceptible cells no infection results. On the other hand a specific antibody often makes its appearance in the serum of a host as it acquires immunity, and this antibody may in some way prevent the virus from entering the susceptible cell. The action of antibody may enable complement to destroy virus before it enters the cell.

But these do not exhaust the possibilities. The virus may enter previously suspectible cells only to find them, after immunity is established, unsuitable for its reproduction, or so hypersensitive to its presence that they die before the virus can set about multiplying. Supposing that virus escapes the antibodies of the blood, it may still enter cells that permit its reproduction, if cellular immunity has not developed. Then it may grow, irritate the cell to division and thus enlarge the sphere of its influence; but



if it gets out of the cell the antibodies prevent its entrance into other cells. However it may persist, latent, within the cells and, taking advantage of opportunities, cause disease again.

The theoretical behavior of virus within a susceptible cell surrounded by fluid which contains effective antibodies is of especial interest in those infections which involve the architecturally complex cells of the nervous system. Structurally the neurons differ from most other cells of the body in the possession of very long, attenuated, cytoplasmic processes which may extend from the central nervous system to the periphery, or from the periphery, through ganglia, into the spinal cord or brain. If a virus can utilize the living cytoplasmic medium for reproduction then it seems obvious that a neurotropic virus might grow along one of these cellular processes from a peripheral portal of entry to its central terminus or *vice versa*. Another structural feature of neurons is that terminal cytoplasmic processes of one cell come very close to, or actually are in contact with, processes of the main body of other neurons, and it seems theoretically possible that virus might progress from one cell to another along these channels without exposing itself to the extracellular environment.

This is exactly what seems to happen in the course of neurotropic infections, and it has been demonstrated, in the case of experimental poliomyelitis among others, that virus may progress and the disease develop as usual, though specific circulating antibodies are present in the serum.

Because virus inside living cells should be protected from the action of circulating antibodies, it is not surprising theoretically that the introduction of immune serum during the course of disease does not seem to be of benefit. It is possible that some virus passing from one cell to another or otherwise discharged from an infected cell, as in the presence of necrosis, may

be inactivated and further extension inhibited or reduced; consequently serum therapy may possibly offer some advantage.

Possible explanations of certain facts of immunity to virus diseases, on the theory of cytotropism, may be partially illustrated graphically on the chart.

The theory of cytotropism of viruses, which hypothesizes that these active agents require a living intracellular environment for multiplication, fits best the known facts concerning the reaction between the host and the virus during infection; and it offers constructive suggestions for analyzing conditions of resistance which often supervene.

This theory does not necessitate a rigid definition of a virus, a requirement which at the present time would be impossible of fulfillment; for it is not known whether viruses are living parasites or sorts of autocatalytic ferments. But it is known that they act as though they were specifically antigenic. In this respect they behave like the antigenic proteids; and whether living or inanimate they would require the activity of living cells for their reproduction.

Because viruses are known to act like antigens and because experience of immunology up to the present time has been largely concerned with the study of serological antibody response to foreign proteids, it has perhaps been too generally expected that parenteral injection of inactive virus-containing materials would result in the production of a protective immunity. Such an expectation has not been realized. It seems probable rather that active immunity has only been induced by the introduction of active virus, and then only if infection, even though an inappreciable one, ensued. The immunizing antigen seems to be a very labile one. It is possible that it is produced only during infection.

The mechanism of the humoral antibody effect is as yet not understood, and the mere presence of antibodies in the blood is not an adequate assurance that the subject bearing them is immune. This is true especially in those viral infections in which the active agent has a predilection for the cells of the nervous system. The cytotropic hypothesis assumes under these circumstances that virus enters exposed neural processes without subjection to contact with antibody-containing fluid.

The very complexity of the pathogenesis of virus diseases may underlie the quite general occurrence of immunity following infection, because of the necessity for the fulfillment of many conditions in order that infection may take place; and likewise this complexity, as it becomes better understood, may offer exceptional opportunities for prophylaxis by the breaking at some vulnerable point of a long chain of necessary interactions between the host and its invader.

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Epidemiology and Symptomatology of Staphylococcus Food Poisoning*

A Report of Recent Outbreaks

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FOOD poisoning due to staphylococci was first reported by Barber [1] in 1914. At the present time 18 outbreaks have been recorded in which the offending staphylococci were shown to be toxic for man or monkey—by the ingestion of milk or broth cultures in 3 instances, and by the ingestion of filtrates in 15 instances. The incriminated foods have been cake and custard-filled or cream-filled bakery goods [2, 6, 7, 8, 10] in 10 outbreaks, raw milk [1, 4, 12, 13] in 4, while cheese,[3] chicken gravy,[5] chicken salad,[9] and tongue sandwiches,[11] were each responsible for a single outbreak. In addition there remains a significant number of food poisoning outbreaks in which staphylococci were thought, for good reasons, to have been the etiological factor though full confirmation is lacking.

The following report of recent outbreaks of food poisoning serves as a reminder of the growing importance of the problem, and is perhaps of value for the added clinical information it may contain.

On the morning of March 27, 1936, a Birmingham physician reported to the Board of Health that he had attended 12 Ensley high school students, all sick with food poisoning after eating cream puffs for lunch on the 26th. The severity of the illness varied though all had the same general symptoms.

Investigation disclosed that the school lunch-room was clean, and its operations met the sanitary requirements of the Board of Health. The lunch-room personnel had not recently changed, none had been ill, and bacteriological examinations (completed 6 months previously) had not disclosed carriers of intestinal pathogens.

For several months the lunch-room had served cream puffs purchased from the same bakery. On the day of the outbreak 18 dozen had been purchased; 4 dozen of these were taken from the school to a neighboring café where most of them were later recovered. There were 693 students fed; 165 ate cream puffs, and 94, or 57 per cent, of these were taken ill. The 528 students who did not eat cream puffs were not sick. Six additional cases developed from cream puffs taken home by lunch-room supervisors and eaten by individuals for the evening meal. In all, 122 cases were discovered, 94 from the school, 8 from cream puffs carried away

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from the school, and 20 from cream puffs sold to 3 cafés and from the bakery truck.

It seems significant that, among 65 students who became ill after eating cream puffs for dessert, following the ingestion of other food, the onset was somewhat more delayed, and the illness decidedly more severe than among 29 who ate only cream puffs. Variations in the concentration of the gastric juice may partly explain apparent differences in susceptibility of these students to enterotoxin. Borthwick [14] states that the active principle of toxic staphylococcus filtrate is destroyed or reduced at a pH lower than 6.8 or higher than 7.8, and he reports rendering guinea pigs suceptible by adjusting the reaction of the stomach contents to a pH of 7.3.

Detailed clinical histories were obtained from both the victims and their attending physicians. The more typical cases may be described as follows:

Within 2–4 hours after eating there was first noticed a feeling of nausea. Severe abdominal cramps developed and were quickly followed by vomiting which was severe and continued at 5–20 minutes intervals for 1–8 hours. The vomitus was blood streaked in 13 per cent of the cases. A diarrhea of 1–7 liquid stools usually began with the vomiting or several hours after its onset. Blood, not infrequently, was present in the stool. During the acute stage the temperature was normal or subnormal, the pulse noticeably increased, there were cold sweats, prostration was severe, and the patients were very definitely in a state of shock. Headache was mild and of a short duration. Muscular cramping, usually of the flexors of the legs, was present in the majority. Dehydration was marked in some.

While the acute symptoms usually lasted only 1–8 hours complete recovery, because of prostration, was delayed for 1–2 days. During this time temperatures of 100° were not uncommon. Three cases were hospitalized. There were no fatalities.

These symptoms with their variations are summarized as follows: The most common interval between eating and the onset of illness was 3 hours. Eighty per cent were ill by the 4th hour, while in a small number the onset was delayed for 6, 7, and 8 hours. Twenty-one per cent were ill only for the short period of 1–4 hours while in 36 per cent recovery was delayed for 25–48 hours. Vomiting was the most

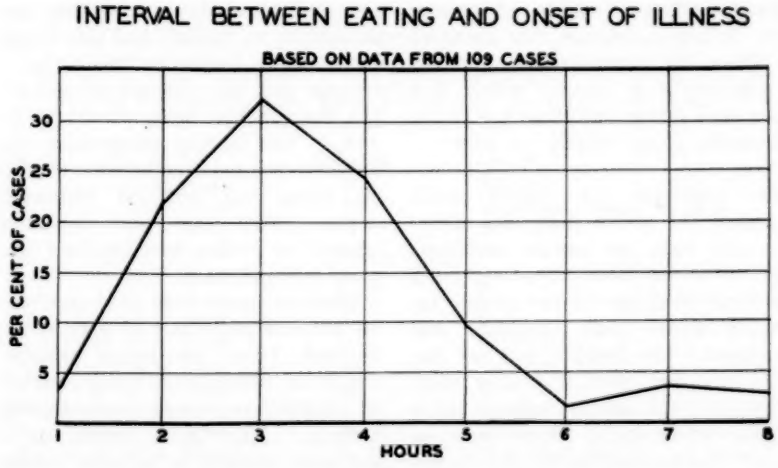

FIGURE I—Interval Between Eating and Onset of Illness

pronounced symptom, and in 50 per cent was described as "continuous." In the majority of cases (92 per cent), however, vomiting had ceased within 5–8 hours. There was severe vomiting in 78.2 per cent, severe abdominal pains in 62.5 per cent, mild diarrhea (1–7 stools) in 72.8 per cent, mild and usually transient headache in 58 per cent, mild muscular cramps in 51.3 per cent and sweating in 67 per cent. Prostration, dehydration, and the degree of shock varied accordingly.

TABLE I

SYMPTOMS OF FOOD POISONING

	Information from No. of Cases	*None* %	*Mild* %	*Severe* %
Vomiting	122	12.1	9.7	78.2
Pains in abdomen	122	4.7	32.8	62.5
Diarrhea	103	12.6	72.8	14.6
Headache	101	29.0	58.0	13.0
Muscular cramping	113	36.3	51.3	12.4
Sweating	100	33.0	67.0	

It should not be inferred from this discussion that the clinical features of staphylococcus food poisoning are distinguishable from those of Salmonella food poisoning, for such is not the case, only bacteriological studies are dependable. It is true, however, that the onset of illness in outbreaks due to the staphylococcus is usually within 2–4 hours after eating, and those due to the Salmonella group usually 12 hours or longer.

On inspection the bakery which furnished the cream puffs was filthy. Not only this, but certain conditions which prevailed were disgusting if not positively revolting. Three grossly insanitary toilets were repugnant and obnoxious. The building was not flyproof and flies were embracing these toilets and the bakery products as a regular rendezvous. There were no proper washing facilities for the 35 employees, and no hot running water on the premises. Wash water for the utensils had the consistency of pea soup, no rinse was used, and the utensils were subsequently wiped with a dirty cloth. The greater part of the large and small equipment was inadequate, improvised, covered with filth, and in such a state of disrepair as to render cleansing impossible even under the best of conditions.

Raw materials were stored in open barrels entirely unprotected from dust, rats, and insects. The finished bakery products were subject to promiscuous handling and, before being wrapped, were often collected in an open garage within 15 feet of the insanitary toilets. Clothing worn by the employees was filthy. There was no history of recent illness, nor of boils or abscesses among the personnel. Such circumstances were not surprising, however, when we consider that for 3 years there had been no routine inspection of food establishments by the Board of Health because of severe financial restrictions. Other bakeries, inspected at a later date, were even more filthy—if such were humanly possible.

The cream puffs in question were all of one batch. The cream filling (approximately 12 gallons) had been heated in a copper kettle by steam for 6 minutes and then allowed to cool for 2½ hours before being placed in the shells. The heating temperature was indefinite and it is questionable whether the filling was rendered reasonably sterile. The time and conditions allowed for cooling were ideal for bacterial multiplication.

Nineteen cream puffs were examined. On physical inspection all appeared to be fresh. Direct microscopic examination of the filling showed large numbers of staphylococci and spore-forming bacteria. Agar plate counts on 4 specimens showed a bacterial content of 50 to 70 million per gram; 99 per

cent of these organisms were *Staphylococcus aureus*. From all 19 specimens *Staphylococcus aureus* was found in abundance, and in all *B. coli Communis* was also present. No bacteria of the Salmonella group were isolated and no carriers of these pathogens were found among the bakery personnel.

Jordan [3] has shown that staphylococci of diverse origin and cultural characteristics are capable of producing a filterable enterotoxin. Stritar and Jordan [15] conclude that there are no good criteria for the differentiation of various types of staphylococci and that in " food poisoning strains " there is no homogenicity of biochemical, hemolytic, or agglutinative characters. From studying a number of strains of staphylococci Woolpert and Dack [16] found that enterotoxin was not formed without the production of other exotoxins and that there seemed to be a rough correlation between the amount of food poison and the amounts of other toxins; these facts are borne out in this investigation.

Nineteen cultures of *Staphylococcus aureus* isolated from different cream puffs fermented maltose, dextrose, lactose, mannite, rhamnose, saccharose, and sorbite without gas; 6 fermented salicin after 1 week; none fermented xylose or inulin. All were hemolytic on blood agar. An antiserum made from one culture (C-3) agglutinated the remaining 18 cultures in amounts varying from 1/8 to 1/2 of the serum titer. These characteristics were the same for both enterotoxin producing and non-enterotoxin producing organisms.

Filtrates of 16 cultures were prepared according to Dolman's [17] modification of Burnet's method. Filtration was through Seitz pads (discarding the first portion of each filtrate) though Woolpert and Dack [16] have shown that these pads adsorb appreciable amounts of exotoxin. When tested with 1 per cent rabbit erythrocytes 5 filtrates produced no hemolysis, 10 were only slightly hemolytic when undiluted, while 1 (C-3) produced complete hemolysis in a dilution of 1/50. Using 2 rabbits, a filtrate of culture C-3 produced dermonecrosis in dilutions of 1/100 and 1/25. Filtrates of other cultures produced little (dilution of 1/5) or no dermonecrosis.

Filtrates for feeding experiments were prepared from broth cultures grown either in air or in 10 per cent

TABLE II

FEEDING EXPERIMENTS WITH BROTH FILTRATES OF STAPHYLOCOCCUS AUREUS ISOLATED FROM CREAM PUFFS

Culture	*Filtrate*	*Individual*	*Result*
C-6	6 c.c. 24 hr. broth	A	Not toxic
	20 c.c. 24 hr. broth	C	Abdominal cramps, headache
	6 c.c. 48 hr. broth	A	Not toxic
	12 c.c. 48 hr. broth	E	Not toxic
R-7	6 c.c. 24 hr. broth	D	Not toxic
	20 c.c. 24 hr. broth	E	Abdominal cramps, 6 liquid stools
	6 c.c. 48 hr. broth	E	Not toxic
	12 c.c. 48 hr. broth	A	Not toxic
R-1 *	10 c.c. 48 hr. broth	A	Not toxic
R-2 *	10 c.c. 48 hr. broth	B	Not toxic
C-2 *	10 c.c. 48 hr. broth	C	Not toxic
C-3 *	10 c.c. 48 hr. broth	E	Toxic (case E)
*	24 c.c. 48 hr. mixed	D	Toxic (case D)

* Grown in 10 per cent CO_2

carbon dioxide for 24–28 hours, and then passed through Seitz pads. In this way, and by graduating the dose, we hoped to produce filtrates only mildly toxic for human volunteers. Filtrates were diluted with 8 oz. of milk just before drinking. An equal number of controls took sterile broth in milk and none reacted. Human susceptibility to enterotoxin varies, and the number of persons used in feeding experiments was probably inadequate to prove the presence or absence of enterotoxin production in some of the strains tested.

Twenty c.c. of a 24 hour broth filtrate of staphylococci from two different cream puffs proved mildly toxic when fed to 2 individuals. One experienced mild headache and abdominal cramps, the other, abdominal cramps and 6 liquid stools. The onset for each was 3 hours. Other individuals receiving smaller amounts of 24 and 48 hour broth filtrates were not affected.

Cultures from each of 4 cream puffs were then grown in broth in an atmosphere of 10 per cent carbon dioxide for 48 hours and filtered. Ten c.c. of these filtrates were fed to 4 individuals while a 5th took 6 c.c. each of the filtrates from all 4 cultures, a total of 24 c.c. Three individuals were not affected.

Individual "D" who took the mixed filtrate was nauseated after 3½ hours, vomited 4 times in the course of 1 hour, the temperature dropped to 97.2° and pulse increased from 80 to 112. The white cell count rose to 15,000, blood pressure remained normal, and there was no diarrhea, prostration, dehydration, or abdominal rigidity. Recovery was complete in 4 hours.

Individual "E", who took 10 c.c. broth filtrate of culture C-3, was desperately ill for 3 hours. Nausea and vomiting developed 2 hours 45 minutes after drinking the filtrate. Vomiting was severe (5 times in the 1st hour). There were 5 liquid stools, 2 containing blood. Pallor was marked, the temperature fell to 96°, and the pulse rose from 84 to 130. Blood pressure fell from 120/80 to 60/40, the white cell count rose to 21,400 with 81 per cent polymorphonuclears. Headache

TABLE III

CASE "D"

Time	*Temp.*	*Pulse*	*Blood Pressure*	*White Count*	*Per Cent Polymorphonuclears*	
0	98.6	80	116/80			Drank 6 c.c. each of broth filtrates from cultures R1, R2, C2, C3. Total 24 c.c. in 8 oz. milk.
0:30						Ate light lunch
3:20 *						* Nausea and abdominal cramps
3:30			116/80			Vomited
3:40						Vomited
3:55						Vomited
4:00	97.2	112	116/80	12,200	71	
4:20						Vomited
4:30	97.8	80	116/80			
6:00				15,000		Recovered except for slight weakness
7:00						Complete recovery

* Onset 3 hrs. 20 min. after drinking broth filtrate. Nausea and abdominal cramps continued for 2 hrs.

TABLE IV

CASE "E"

Time	Temp.	Pulse	Blood Pressure	White Count	Per Cent Polymorphonuclears	
0	98.6	84	120/80			Drank 10 c.c. broth filtrate of culture C-3 in 8 oz. milk. Did not eat lunch.
2:45						* Nausea and abdominal cramps, slight dizziness
3:00						Vomited, large liquid stool, marked pallor
3:15						Vomited
3:30						Vomited, liquid stool
3:40						Vomited
4:00	97.4	120				Vomited, liquid stool
4:30	97.4	120				
5:00	96.0	110				
5:30	96.0	100	75/55	21,400	81	Bloody liquid stool
6:00	97.4	108	75/55			
6:30	97.0	130	60/40	16,400	77	Bloody liquid stool
9:00	98.6	110				Marked prostration

* Extreme nausea, abdominal cramps, and prostration continued for 4 hours from onset.

was mild at the onset and of short duration, there were cold sweats, and prostration was severe. There was no abdominal rigidity. Dehydration was moderate but probably did not entirely account for the increased white count. The acute symptoms passed in 4 hours but weakness persisted for 2 days.

The findings in these two experimental cases follow those of the mild and severe cases of food poisoning experienced in this outbreak and appear to establish *Staphylococcus aureaus* as the cause. The opportunities for contamination of the bakery products were so numerous that it seems highly improbable that the source of the infection can ever be determined. Cultures of staphylococci were isolated in large numbers from the throat of one of the bakery personnel, from various parts of the machinery, and from the feces of 1 patient. Their broth filtrates were not toxic with feeding tests.

The bakery was cleaned up and continued to operate. On May 11, 3 individuals, living in different sections of the city, were admitted to a local hospital severely ill with food poisoning. The symptoms were the same as those described for the first outbreak. All had subnormal temperatures and white cell counts above 10,000 (10,750 with 84 per cent, 11,850 with 78 per cent, 38,800 with 89 per cent polymorphonuclears). In addition each had marked abdominal rigidity (board-like in 2) and the general picture was that of an acute abdominal condition requiring surgery. In fact, a pre-operative diagnosis of "ruptured peptic ulcer" was made on 1 patient and a laparotomy performed.

Each patient had eaten in a different café and had partaken of cocoanut custard pie baked by the bakery involved in the first outbreak. Portions of two pies eaten by 2 individuals were recovered and found to contain enormous numbers of *Staphylococcus*

aureus. Twelve other persons were thought to have eaten portions of three pies involved but no other cases could be discovered. Following this incident, the bakery has been permitted to bake only bread and rolls.

It should be realized that the number of reported cases of food poisoning falls far short of indicating the frequency with which sporadic cases result from contaminated commercially prepared foods. Due to publicity given recent outbreaks in Birmingham numerous suspected cases of a sporadic nature have come to our attention, and we have every reason to believe that during the summer months such cases are of daily occurrence.

By way of controlling such outbreaks certain practices common to many bakeries should be eliminated. They have been emphasized in other reports but may well be repeated here. Custard-filling in the usual course of its preparation is heated to temperatures at which staphylococci will not survive, and failure to destroy the organism is evidence of improper cooking. Dack [2] has shown that the organisms in broth culture are destroyed by exposure to 80° C. for 15 minutes. McBurney [7] found that as many as 2,500,000 staphylococci per c.c. of liquid custard were killed by cooking at 85° C. for 10 minutes. To avoid contamination after cooking the filling should be properly covered, and cooled at refrigerator temperatures. Excessive handling of the shells or the filling should be avoided, and all machinery used should be thoroughly cleansed and properly sterilized. The finished product should be properly covered or wrapped, and stored at refrigerator temperatures. Obviously the building should be fly proof, and reasonably free of rodents and insects. Proper toilet facilities should be provided for the personnel. Machinery and equipment should be adequate to handle the volume of business undertaken.

Adequate inspection service, aside from checking all physical equipment, must exert some supervision over the methods of preparation and distribution of the food products. Those bakeries which cannot reasonably comply with regulations because of antiquated and improper physical equipment, or who refuse to comply for other reasons, should, at least, be promptly prohibited from making any product not subjected to the same oven temperatures as bread and rolls.

No matter how essential certain requirements may appear to the inspector they always seem unreasonable to the proprietor unless he understands why they are made. While educational programs are necessarily slow and time consuming, more progress can be expected if the proprietor understands how such control measures protect his business, as well as the public. Unless coöperation is obtained, inspection service reverts to purely police methods which are undesirable and often ineffective. Outbreaks frequently occur in bakeries that are scrupulously clean but where some breach of technic has presumably occurred. Educational programs directed toward plant operators and their personnel are, therefore, of considerable importance. Medical examinations and bacteriological attempts at detecting carriers would, as a routine measure, seem to offer little of definite value.

Finally, in the many cities where inadequate appropriations allow only a pretense at actual control of food products, it seems essential that the greatest effort be directed toward those small and large establishments which prepare, manufacture, and distribute foods, rather than the small retailers who may dispense products already contaminated before reaching their hands.

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Scarlet Fever Control

LAST February, Dr. Hobson of Oxford published a most interesting series of cases and observations. He found that:

1. An erythema is inconstant in infections due to a haemolytic streptococcus.
2. It may be a feature of those due to a non-haemolytic streptococcus.
3. Though it is more frequent in infections due to haemolytic streptococci, it is a poor guide to the course, prognosis, or infectivity of the disease in a given patient.
4. Infections due to haemolytic streptococci *with or without an erythema*, are generally highly toxic, highly infectious, and have a striking association with sequelae of all kinds. *The appearance of an erythema is probably a favourable sign.*
5. An infection due to a non-haemolytic streptococcus may have sequelae in no way distinguishable from those due to a haemolytic strain, whether there is an erythema or not.

If, as he says, these statements and conclusions are sound—and they have not been refuted so far—then it is pertinent to consider what alterations in, or modifications of, existing practice and teaching should be introduced.—Andrew W. Forrest, M.A., M.D., Ch.B. (Edin.), D.P.H., Scarlet Fever Control on Modern Lines. Presidential Address at a joint meeting of the Home Counties Branch and the Fever Hospital Medical Service Group, *Pub. Health*, 49, 12:413 (Sept.), 1936.

Standardization of Typhoid and Paratyphoid Vaccines*

I. The Value of the Gates Apparatus and Total Nitrogen Determinations

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THE multiplicity of methods proposed for determining the "strength" of bacterial vaccines indicates that all fall short in respect to one or the other of the two essential requirements, simplicity and precision. It usually happens that when simplicity is sought accuracy is sacrificed. When precision is demanded the method becomes complicated or cumbersome.

In principle, the methods proposed may be classified as those of:

1. Direct enumeration in a counting chamber
2. Indirect enumeration:
   (a) Wright's method
   (b) Colony count
3. Physical measurement:
   (a) Weight of dried bacteria
   (b) Volume of bacteria
4. Chemical measurement:
   (a) Total nitrogen determinations
5. Turbidity measurement:
   (a) Opacimetric
   (b) Nephelometric
   (c) Photometric
   (d) Photoelectric
6. Serologic measurement

No matter what method is adopted for standardizing vaccines the result is usually expressed in millions of bacteria per c.c. There is a growing feeling that this practice should be abandoned and that some other measure which more nearly represents the antigenic content should be adopted, because counts fail to take into consideration the size of organisms. Brown [1, 2] has proposed that the weight of the dried bacteria be substituted for the number of bacteria present, and has shown that the opacity of a bacterial suspension is intimately associated with the dried weight. Since antigens are very closely associated with proteins there is reason to believe that the total nitrogen of the bacteria might be an even better measure of the amount of antigen present. Mueller [3] has recommended the use of micro-Kjeldahl determinations for this purpose. Until there is some general agreement in regard to such a change, however, it seems more expedient to continue to express the bacterial content in numbers of bacteria.

Smith [4] in 1925 reviewed many of the papers dealing with methods of

* Read before the Laboratory Section of the American Public Health Association at the Sixty-fifth Annual Meeting in New Orleans, La., October 21, 1936.

standardizing bacterial vaccines and noted the general dissatisfaction with all methods then in use. He presented evidence of the marked inaccuracies of Wright's method and maintained that the direct count in the Helber counting chamber offered the most acceptable means of standardization. He admitted, however, that the results obtained varied with the observer and the technic used. Since the method is cumbersome and requires an average of several counts for accurate results, it has never come into general use. Most workers prefer to use the direct count for standardizing some simpler method which does not depend so much upon experience with the technic, dexterity, and constant practice.

The simplest and perhaps the most frequently used method is some means of determining the turbidity of bacterial suspensions. Holker [5] claims that measurements of opacity are subject to less variation than direct counts. Various kinds of standards have been proposed with which the opacity of the suspension to be standardized may be compared, some consisting of bacterial suspensions and others of insoluble inorganic substances in suspension. Baylis [6] has proposed a photometric method, and recently the photoelectric cell has been utilized for determining turbidities of bacterial suspensions. Most of these methods are subject to the criticism that they depend upon standard suspensions which change with age, and that therefore the standards must be re-standardized from time to time. Some also require complicated apparatus not usually available or readily kept in working order.

Gates [7] in 1920 recommended the disappearing loop as an instrument for standardizing vaccines. Holker [8] claims priority for the idea for Don and Chisholm.[9] Their apparatus was not strictly comparable to that proposed by Gates, nor did they claim to have originated it. They merely described a method which had been in use for several years for determining the turbidity of water samples but had not been applied to bacterial suspensions. Holker [8] states that he himself had independently worked out the method, but had discarded it in favor of an apparatus of his own design, which appears more cumbersome and probably no more accurate than the Gates apparatus. Some of the objectionable features mentioned by him have been eliminated by a modification described later in this paper.

The disappearing loop has been in use in this laboratory for several years for controlling the turbidity of vaccines for injection into horses. In addition to the advantage of having no standard tubes to deteriorate with age, it is useful because: (a) the apparatus can be assembled in any laboratory; (b) it is simple and easy to use; (c) experience with the apparatus is not of great importance; (d) the results obtained are quite accurate; (e) the size of the tube used is of little importance; (f) living cultures can be handled with ease and little danger.

During the time that this laboratory has been manufacturing typhoid-paratyphoid vaccine, one of the simpler methods (opacimetric) has been used to estimate the bacterial content of the three bacterial suspensions which are combined to make the triple vaccine. In comparing vials of triple vaccines made at various times it was noted that there was a considerable difference in opacity. An investigation was undertaken to determine the degree of variation and to find a method which would reduce it to a minimum.

The opacity of some of the monovalent vaccines prepared and standardized by the old method was determined with the Gates apparatus.

Typhoid vaccines supposed to contain 2,000 million bacilli and paratyphoid suspensions supposed to contain 3,000 million bacilli per c.c. showed marked differences in turbidity as gauged by corrected Gates readings.

Later in the study total nitrogen determinations by the micro-Kjeldahl method were undertaken. At that time the apparent variations in the bacterial content of the old lots of triple vaccines were confirmed. The total nitrogen of some lots was as low as 20 mg. per l., while others contained almost 60 mg.

The problem was to determine what corrected readings would represent 2,000 million or 3,000 million bacilli in these suspensions. This necessitated parallel corrected readings and direct counts on a number of vaccines, which were most easily made on experimental lots.

A MODIFICATION OF THE GATES APPARATUS

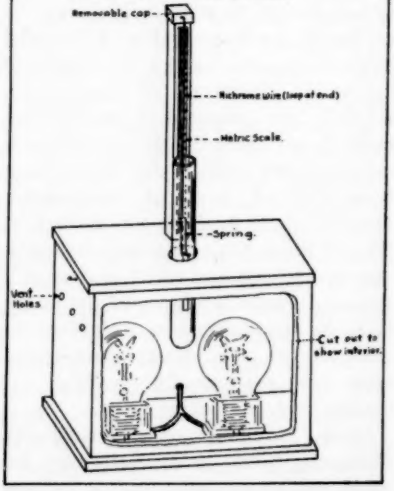
The original Gates apparatus consists essentially of a test tube holder with a sliding bar, calibrated in millimeters, to which is attached a nichrome wire loop. The method of use is simple, the loop being pushed under the surface of a bacterial suspension until it just disappears and the depth read off on the metric scale.

It was early discovered that consistent readings on the same vaccine were obtainable only under constant light conditions, otherwise readings made at different times of the day or on dark days and clear days are not within a satisfactory range. If a constant light is provided and all readings are made in a darkened room the readings are quite consistent.

The modified apparatus is a wooden box containing two 25 watt daylight bulbs. The inside of the box is painted with aluminum paint and the wires in the bottom are covered with a piece of white cardboard so that reflection will increase the evenness of the illumination. In the center of the top is a hole just large enough to admit a ¾" x 6" test tube. Just behind the hole an upright, with an attached metric scale, is firmly fixed (Figure I). A piece of nichrome wire attached to a removable cap on the upright is bent down parallel to the metric scale and at a point even with "0" on the scale the wire is bent out at a right angle and a loop 3 mm. in diameter is formed so that it will be in the center of the tube when the bacterial suspension is in place for making a reading. A spring extending above and below the hole in the top of the box has enough tension to hold the tube securely at any level. The readings are made by observing the point on the metric scale opposite the top of the brightly illuminated meniscus. It will be noted that in the modified apparatus the tube is moved up and down until the loop disappears, whereas with the original apparatus the loop is moved up and down and the tube remains stationary. The electric bulbs are so mounted on each side of the hole through which the tube extends, and the holes for ventilation of the box are so placed, that no direct rays reach the eye of the observer.

FIG I.

MODIFICATION OF GATES APPARATUS



METHOD OF USING THE GATES APPARATUS

The cap, to which the wire supporting the loop is attached, is removed

TABLE I

TABLE OF DILUTIONS FOR MAKING SECONDARY READINGS WITH THE GATES APPARATUS

Reading on Primary Dilution	*Dilution for Secondary Reading*	*Actual Volumes in c.c. for ¾ x 6 in. Tube*	
		Vaccine	*Saline*
1.0	1 + 16	1.5 +	24
1.1	1 + 16	1.5 +	24
1.2	1 + 13	2.0 +	26
1.3	1 + 13	2.0 +	26
1.4	1 + 10	2.5 +	25
1.6	1 + 10	2.5 +	25
1.7	1 + 8	3.0 +	24
1.9	1 + 8	3.0 +	24
2.0	1 + 6	4.0 +	24
2.1	1 + 6	4.0 +	24
2.2	1 + 5	4.0 +	20
2.3	1 + 5	4.0 +	20
2.4	1 + 4	5.0 +	20
2.6	1 + 4	5.0 +	20
2.7	1 + 3	7.0 +	21
3.4	1 + 3	7.0 +	21
3.5	1 + 2	9.0 +	18
4.2	1 + 2	9.0 +	18
4.3	1 + 1	14.0 +	14

from the apparatus and a tube containing the suspension to be standardized is inserted through the hole in the lighted box. With the loop inside the tube, the cap is replaced. The tube is raised slowly until the loop fades from view and its depth below the meniscus of the suspension is noted. Although the depth increases when the suspension is diluted the relation between the successive readings and the dilution is not inversely proportional, for reasons which are discussed in detail by Gates[7] and need not be repeated here.

By making two readings, one on the original suspension and another on a known dilution of the original, *corrected* readings can be computed which are inversely proportional to the dilution within certain ranges of opacity. These corrected readings are calculated by the following formula:

$$\text{Corrected Reading} = \frac{\text{Volume A } (b - a)}{\text{Volume B} - \text{Volume A}}$$

when "a" is the depth of disappearance in the original suspension; "b" that in the known dilution; Volume A the amount of the original suspension used in making the secondary suspension, and Volume B the total volume of the second suspension.

The formula is made unnecessary and the calculations are simplified if the dilution of the second suspension is expressed as 1 *plus* the volume added instead of 1 *to* the total volume (*e.g.*, 1 + 10 instead of 1 : 11). When this is done the calculations consist merely of dividing the difference between the two observations by the second figure indicating the dilution. The following example shows the simplicity of the calculations:

Original suspension, depth of disappearance	1.4 cm.
1 + 10 dilution of original, depth of disappearance	8.2 cm.
Difference	6.8 cm.

Corrected Reading: $6.8 \div 10 = 0.68$

POINTS TO BE OBSERVED IN USING THE APPARATUS

1. The depth of disappearance in the original suspension should always exceed 1.0 cm. When the suspension is too opaque, a dilution should be made on which to obtain the primary reading. The corrected reading obtained will now be that of the dilution, and in order to calculate the corrected reading of the original suspension it will be necessary to divide by the dilution factor. That is, if the dilution was 1:2 the corrected reading of the original will be ½ of that of the dilution.

2. Greater accuracy is obtained when the secondary suspension is as dilute as possible. Table I has been compiled from readings made in this study. It shows the best dilution to be used for the secondary reading when the original suspension has given primary reading.

3. When beginning observations it often takes a moment or two for the eye to become adjusted. A sufficient number of observations should be made so that 3 or more successive readings fall within a very close range.

4. Differences in visual acuity make slight but constant differences in the readings made by different individuals, so that it is well to

determine how closely the various persons taking part in standardizing vaccines will agree. These differences are minimized when the readings of two or three individuals are averaged.

5. As will be shown, the turbidity of bacterial suspensions decreases during heating, and also when standing in the presence of tricresol. It becomes stabilized rapidly after the tricresol is added, and there is little further change during the course of a year.

Preliminary Experiments — Because there was a tendency for the vaccines to clump on heating and subsequent centrifuging the first observations were made upon freshly suspended vaccines. It was soon discovered, however, that there was a considerable decrease in the count and turbidity after heating, centrifuging and contact with tricresol. For these reasons it was found advisable to delay standardization until after resuspending in salt solution containing tricresol. Moreover, when only smooth cultures were used in producing vaccines, clumping was minimized and more satisfactory counts were obtained.

Experimental Lots of Monovalent Typhoid Vaccine—Direct counts in the Helber counting chamber and corrected Gates readings were made on 23 experimental lots of vaccine produced from a smooth Rawlings typhoid strain, grown and handled in the manner used for routine lots. Each vaccine was made of the washings from 4 to 10 Blake bottles suspended in 40 c.c. of saline for each bottle. Counts and corrected readings were made on the vaccines when freshly suspended and after heating, centrifuging, and resuspending in salt solution containing 0.4 per cent tricresol. Only the observations on the resuspended vaccines are shown in Table II.

Corrected readings for 1,000 million bacilli were calculated for each of the 23 lots. Since counts and corrected readings are inversely proportional this consists of multiplying the observed corrected reading by the direct count and dividing by 1,000 million. The calculated corrected readings fall very close to the mean (3.48) of the 23. The variations from the mean would be much smaller if direct counts could be more accurately made. As many as 10 counts were made on some of the lots without getting close checks between them. The variations were often as large as 25 per cent.

Using a round number for the mean which errs slightly toward the more turbid side, a corrected reading of 3.40 can be considered as equivalent to 1,000 million typhoid bacilli. The counts indicated by the Gates readings were calculated on this basis for the 23 lots by multiplying 3.40 by 1,000 million and dividing by the corrected reading of each lot. In most instances the count predicted from the Gates reading corresponded very well to the direct count. The correlation coefficient between the two series is $+0.835 \pm 0.064$.

At this point in the study it was decided to include, as an additional check on the direct counts, total nitrogen determinations on these experimental vaccines.

Micro-Kjeldahl Determinations of Total Nitrogen—Attempts to make nitrogen determinations on the whole vaccine were not satisfactory. Amounts as small as 1 c.c. did not contain sufficient nitrogen to give accurate figures. It took several hours to evaporate the water from 5 c.c. and 10 c.c. samples and in addition duplicate and triplicate samples failed to agree. Mueller's [3] determinations are made on centrifuged bacteria. When this method was adopted, and 10 c.c. samples of the vaccines were centrifuged in the tubes in which digestion was to be done, determinations made on the sediment only gave good agreement between duplicate and triplicate samples. A surprising

TABLE II

DIRECT COUNTS, CORRECTED GATES READINGS, AND TOTAL NITROGEN DETERMINATIONS ON 23 EXPERIMENTAL LOTS OF MONOVALENT TYPHOID VACCINE

Lot Number	*Direct Count (Millions)*	*Corrected Gates Reading*	*Calculated Corrected Reading for 1,000 mil. Bacilli*	*Calculated Count for Corrected Reading of 3.4 (Millions)*	*Total Nitrogen (Milligrams per Liter)*	*Calculated Total Nitrogen for 1,000 mil. Bacilli (Milligrams per Liter)*	*Calculated Count for 22.5 Milligrams of Nitrogen (Millions)*
TE22	13,000	0.280	3.64 [1]	12,300 [2]	272	20.9 [3]	12,000 [4]
TE23	11,000	0.315	3.47	10,700	243	22.1	10,800
TE24	13,000	0.280	3.64	12,300	292	22.5	13,000
TE25	8,500	0.375	3.18	9,100	196	23.1	8,700
TE26	10,100	0.315	3.19	10,700	259	25.6	11,500
TE27	12,000	0.295	3.54	11,500	257	21.5	11,400
TE28	14,200	0.270	3.81	12,600	288	20.4	12,800
TE29	10,700	0.315	3.38	10,700	247	23.1	11,000
TE30	10,900	0.300	3.27	11,300	244	22.4	10,800
TE31	10,900	0.290	3.17	11,700	260	23.9	11,500
TE32	10,700	0.335	3.58	10,200	237	22.2	10,500
TE33	11,000	0.345	3.79	9,800	214	19.9	9,500
TE34	10,400	0.300	3.12	11,300	225	21.6	10,000
TE35	9,700	0.330	3.21	10,300	220	22.7	9,800
TE36	10,000	0.325	3.25	10,500	243	24.3	10,800
TE37	10,600	0.330	3.51	10,300	226	21.3	10,000
TE38	9,500	0.419	3.97	8,100	189	19.9	8,400
TE39	11,600	0.335	3.87	10,200	242	20.9	10,800
TE40	10,400	0.342	3.55	9,900	209	20.1	9,300
TE41	11,100	0.330	3.66	10,300	245	22.1	10,900
TE42	11,800	0.298	3.52	11,400	270	23.9	12,000
TE43	9,500	0.335	3.18	10,200	228	24.0	10,100
TE44	8,000	0.440	3.52	7,700	177	22.1	7,900
			Mean = 3.48			Mean = 22.2	

1. $\frac{13{,}000 \times .280}{1000} = 3.64$

2. $\frac{3.4 \times 1000}{.280} = 12{,}300$

3. $\frac{1000 \times 272}{13{,}000} = 20.9$

4. $\frac{272 \times 1000}{22.5} = 12{,}000$

fact was that the figure obtained in this way was usually as large, and sometimes even larger, than that obtained on the whole vaccine. The loss with the whole vaccine apparently occurs because a portion of the nitrogen is carried off with the vapor during the process of evaporation before digestion begins.

The figures given in this paper represent the total nitrogen of the bacilli only. It must be borne in mind that there is an additional 10 to 20 per cent of nitrogen in the supernatant.

Total nitrogen determinations (Table II) were made on each of the above experimental typhoid vaccines. The total nitrogen for 1,000 million bacilli was then calculated for each lot, the mean of the series being 22.2 mg. per l. Again using a round number toward the more concentrated side, a total nitrogen of 22.5 mg. can be considered as equivalent to 1,000 million bacilli. The counts indicated by nitrogen determinations were calculated on this basis for the 23 lots by multiplying the total nitrogen by 1,000

TABLE III

CORRECTED GATES READINGS, COUNTS, AND TOTAL NITROGEN DETERMINATIONS ON 26 ROUTINE LOTS OF MONOVALENT TYPHOID VACCINE

Lot No.	Corrected Gates Reading	Total Nitrogen (Milligrams per Liter)	Calculated Corrected Reading for 22.5 Mg. Nitrogen	Counts		
				Direct Counts	Counts Estimated from Corrected Reading	Counts Estimated from Total Nitrogen
182A	3.05	23.8	3.23	990	1,120	1,060
182B	3.12	24.4	3.39	....	....	....
182C	3.15	23.8	3.33	....	....	....
182D	3.15	24.7	3.46	....	....	....
183A	3.12	24.4	3.37	....	....	....
183B	2.98	24.0	3.16	950	1,140	1,070
184A	3.45	20.8	3.18	795	990	925
184B	3.45	21.5	3.29	....	....	....
184C	3.93	17.3	3.02	....	....	....
185A	1.68	49.0	3.66	1,990	2,020	2,180
185B	1.75	43.7	3.39	....	....	....
185C	2.00	35.3	3.14	....	....	....
185D	3.05	24.8	3.37	....	....	....
186	1.48	48.2	3.17	2,190	2,290	2,140
187A	1.68	49.0	3.66	1,830	2,020	2,180
187B	2.00	38.4	3.41	....	....	....
187C	2.00	36.8	3.27	....	....	....
188A	1.85	46.0	3.78	....	....	....
188B	1.79	46.7	3.72	....	....	....
189A	1.80	47.0	3.76	2,210	1,890	2,090
189B	1.58	47.5	3.33	2,220	2,150	2,110
189C	1.45	50.0	3.22	2,460	2,340	2,220
189D	1.35	53.5	3.22	....	....	....
189E	1.60	47.8	3.40	....	....	....
190A	1.45	49.7	3.21	2,310	2,340	2,210
190B	1.55	51.4	3.54	2,225	2,190	2,280

Mean = 3.37

million and dividing by 22.5. Again the counts predicted corresponded very closely to the direct counts. The correlation coefficient between the two series is $+0.843 \pm 0.060$. It will be noted that the counts estimated from the corrected readings and those from the total nitrogens run more closely parallel to each other (correlation coefficient: $+0.937 \pm 0.025$) than either estimate does to the direct count, which would indicate that both of these measures are more consistent than the direct count.

Application in the Standardization of Routine Lots—When the floods of the past spring required the rapid production of large quantities of typhoid vaccine, the figures on the experimental lots had just been accumulated. Corrected Gates readings were therefore substituted for the opacimetric method previously employed for standardizing monovalent vaccines to contain the desired number of bacteria. Total nitrogen determinations were then made on these diluted vaccines and a few direct counts were made. Table III gives the figures on 26 routine lots made at that time. The calculated corrected readings for 22.5 mg. of nitrogen fall within a satisfactory range from the mean.

Counts were estimated from both the

corrected reading and the total nitrogen for each lot on which direct counts were made. Again it will be noted that these estimates run more closely parallel to each other than either estimate does to the direct count. Estimates were made for the remaining lots and the correlation coefficient between the two series computed. In this case the correlation between the counts indicated by the corrected readings and those indicated by the total nitrogens was $+0.979 \pm 0.008$.

The first 9 lots were intended for distribution as monovalent vaccine during the emergency and were standardized as soon as prepared at 1,000 million bacilli. Because the turbidity had not become stabilized, they could not be adjusted exactly to a corrected reading of 3.4, an allowance for a decrease in turbidity being necessary. All the readings in Table III are those made several days after standardization. An error in calculation of volumes caused Lots 184A, B, and C to be diluted too much.

The remainder of the lots were also standardized as soon as resuspended, but were meant to contain 2,000 million bacilli (corrected reading of 1.7). If these suspensions could have been set aside until the turbidity became stabilized, they could have been more accurately standardized. Most of the lots contained more than 2,000 million bacilli. This was intentional as more salt solution can be added to bring up the volume when mixing with the paratyphoid fractions of the triple vaccines. Since a year's supply of vaccine was accumulated by the end of the emergency, no observations on additional lots have as yet been made.

The Standardization of Monovalent Paratyphoid Vaccines—Because our *B. paratyphosus* A culture is slightly smaller than our smooth Rawlings typhoid strain and our *B. paratyphosus* B culture is very much larger, the same corrected reading cannot be used in standardizing them. We plan to obtain a smooth culture of each more nearly of the same size as the typhoid strain before accumulating a series of observations on experimental lots of vaccines made from them. Meanwhile we are standardizing them by total nitrogen determinations.

DISCUSSION

Our experience with the Gates apparatus has convinced us that the method is as accurate for routine use in standardizing bacterial vaccines as direct counts. Since this is so, the simplicity of the method should cause its wide adoption in the standardization of bacterial suspensions of all kinds. Usually it would be necessary to do parallel counts or total nitrogen determinations on only a few vaccines made with a particular organism to determine the corrected reading corresponding to the bacterial content desired.

When it was determined that 1,000 million typhoid bacilli represented a total nitrogen of about 22.5 mg. per l., it was apparent that many lots of vaccine which had been distributed contained fewer than the labeled 2,500 million organisms per c.c. Only an occasional lot had contained the estimated amount of nitrogen ($2.5 \times 22.5 = 56.25$) for that number of bacilli. To push up the bacterial content suddenly did not seem advisable. Lots have therefore been standardized for the time being to contain about 2,000 million bacilli (45 mg. N.). A questionnaire was sent recently to a number of state institutions where large numbers of patients are routinely given these vaccines. Replies indicated that reactions during the last few months had not increased in frequency or severity with the increase in bacterial

content. Two complaints had been sent to us just before the questionnaire was sent out. In one instance the lot used contained 58.7 mg. N. per l.; the second contained less than 40 mg. N. Unless undesirable reactions begin to be reported, the bacterial content of the triple vaccine will be increased from time to time until it contains the labeled 1,000 million typhoid bacilli and 750 million of each of the paratyphoids.

SUMMARY AND CONCLUSIONS

1. A modification of the Gates apparatus, which increases its accuracy, is described.

2. This modified Gates apparatus offers a simple and accurate method of standardizing bacterial vaccines.

3. When a typhoid vaccine made from a smooth Rawlings strain is standardized at a corrected Gates reading of 3.40 the likelihood of its containing exactly 1,000 million bacilli per c.c. is as great, if not greater, than if it is standardized by direct count.

4. The total nitrogen of the centrifuged bacilli from such vaccines, standardized at a corrected Gates reading of 3.40, is very close to 22.5 mg. per l.

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Rejuvenation Theories Biologically Unsound

I AM quite sure that we shall overcome all those causes of sickness which can be overcome by the full exercise of the powers we possess, or which further research may give us, but I see no warrant whatever for supposing that we can prolong human life indefinitely or that we can overcome the infirmity of age.

It seems to me that the favourable interpretation which some have placed on experiments in tissue culture and the results of researches into endocrine functions, indicating the possibility of rejuvenation, is biologically unsound, though I am prepared to admit that they do offer a hope that we may arrange human ageing to be more regular and so diminish the numbers which die from irregular deterioration of their organs.—Dunstan Brewer, D.P.H., *Ann. Rep., Medical Officer of Health for the Year 1935*, Borough of Swindon, p. 6.

Mental Hygiene in Public Health*

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WHAT is mental hygiene? What can we hope to accomplish in the way of preventing mental disorder? What content is available for the formal presentation of mental hygiene principles and practices? Where should the emphasis be placed in developing more adequate and widespread constructive attitudes to mental disorder and mental health? To whom or to what groups does the responsibility for the promotion of mental health and prevention of mental disorder fall?

These and other questions are being persistently presented from the field of public health and preventive medicine to specialized workers in the field of mental health. They seem to be indicative of the growing realization for the necessity of including mental health considerations in public health programs. I hope they indicate a realization that mental health is not separate and apart from physical health. Health, physical and mental, represents one single complex state of adjustment.

When a physician with broad representative interests in the fields of public health and preventive medicine, with evident interest in finding an answer, issues the challenging question: "Now, just what is mental hygiene?" —what shall we say? Perhaps we are justified in countering with: "What is preventive medicine?" The counter question is not one way of evading the original query. It actually implies the answer because the principles which have applied in the field of preventive medicine are exactly the principles which must apply in any program to promote mental health and prevent mental disorder.

On the basis of our present knowledge of how the individual grows and the factors in his routine and environment which favor healthy physical growth, of how he responds satisfactorily or fails in the face of certain environmental hazards, this knowledge together with some understanding of individual constitutional factors, represents the basis upon which the present program for insuring healthy physical growth and avoiding physical disease has been established. Health programs have proceeded:

1. To provide so far as is possible the positive factors which favor adequate growth
2. To simplify the environment by the removal of certain hazards
3. To build up the resistance of the individual through establishing specific immunities to certain other hazards.

Through general educational measures larger and larger groups in the community have been acquainted with the principles and factors which make for

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healthy growth and the means to be taken to avoid sickness.

If for the moment for the purpose of convenience in this discussion, we might consider mental health apart from physical health, exactly the same principles and practices are applicable for the promotion of mental health and the prevention of mental disorder. As to how we shall proceed, this must depend upon:

1. What we now know or may learn about mental growth and the nature and causes of mental disorder
2. How far we can evolve from this knowledge, adequate mental health principles and practices
3. How far we can effect a satisfactory integration of these principles and practices in public health and medical programs

Mental health implies an adequate relationship as between the individual and, reality in the form of experiences, reality as it exists outside the individual in his physical and social environment, and reality as it exists within himself in the terms of his own feelings, thoughts, desires, drives to action, assets, and limitations. Mental disorder, when it occurs, represents as does physical disease, some failure of the individual in relation to experience, with exactly comparable evidences of dysfunction and distortion or arrest of normal growth. The individual becomes what he does by virtue of his inherited constitutional make-up together with what goes forward in the way of growth. What the individual inherits, on either the physical or the mental constitutional aspects, are "potentials for growth." So far as we know he does not inherit mental disease as such nor the attitudes and personality characteristics which we see manifested in his later behavior. He inherits potentials which in the course of experience are developed and modified to produce what we later find in the way of personality adjustment.

Apart from the general health measures for the elimination of the physical factors, organic and toxic, which are accompanied by disturbed mental functioning, there is only one major gateway to mental health and that is through mental growth. Mental growth represents just as definite and orderly a process as does physical growth. Adequate mental growth implies a progressive re-distribution of interest-energy from self to outside interests. In the course of this process there must take place a progressive re-placement of infantile self-values and infantile sources of satisfaction by more adult social values and adult satisfactions. That is, this forward-going process involves a continuous relinquishing of values which are normal for one phase of development in favor of the values which we recognize as normal for a later period. Self-interest of course is maintained throughout life as perhaps the principal motivating factor for activity. The healthy mature adult, however, finds his self-satisfactions largely in terms of interest and effort directed away from himself rather than in terms of the naïve, dependent, demanding self-values of the infant. On the other hand, the emotionally immature adult, has retained in his values much of the infantile dependent quality which demands a great deal in the way of ministration and attention to his immediate needs which blocks his ability to get satisfaction out of independent effort and which is impatient of any thwarting or delay in securing his objectives.

The person who is not reasonably mature from an emotional standpoint is essentially a poor mental health risk. There is a lack of essential adult satisfactions, an underlying feeling of inadequacy in relationship to his fellows which determines an inadequate response to any sort of critical experi-

ence in the form of disappointments or deprivations or in the face of demands for unusual effort. One sees clinical evidences of inadequate maturity at all chronological levels and we must have standards and criteria available to enable us to determine in any cross-section the adequacy and the significance of the personality responses which we observe.

Today I have seen a man of 45—a man with fine intellectual capacity, holding an important executive position in business but responding in a way which is habitual for him, in the face of difficult or disappointing situations. He has been in bed for over a month following a slight influenzal cold. He berates the inefficiency of his physicians because they tell him that his lungs and heart are all right. He stresses his difficulty in breathing, his general weakness, but on the other hand he is being ministered to as completely as he was when he was 6 months old.

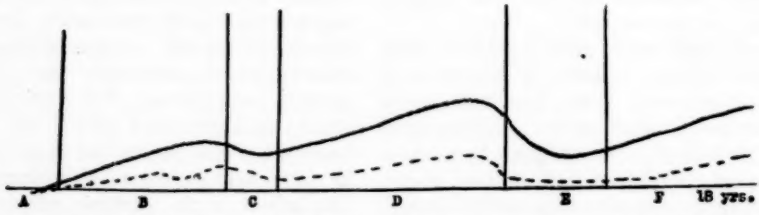
In this same clinical day I had seen a man of 42 who, in the past 6 or 8 years, has been described as a manic-depressive person. There have been periods of extravagant, hypomanic activity leading to indiscretions in behavior, over-indulgence in alcohol, social and business indiscretions. These periods have been followed by depressive phases in which he is exaggerating his feelings of inadequacy and using these feelings as a way of avoiding what he feels are onerous and difficult responsibilities. In this particular problem it does appear that the mental disorder is not in response to constitutional biological factors, but that we are dealing with a person who is emotionally immature, whose infantile self-values have been so completely maintained and reinforced by over-protection during the developmental years, that he is quite unable to accept with satisfaction the responsibilities which adult life has brought. Over a period of 17 or 18 years he has used his domestic situation in an attention-getting, bolstering way, but all the time with an underlying discontent and dissatisfaction with what he vaguely has realized were inadequate responses. This patient's reaction to the breaking up of the domestic situation has been a further depressive episode in which, instead of being able to crystallize the situation and recognize his responsibilities, he spends his time bewailing his own lack of fitness, his inability to accept his business responsibilities and make decisions, his discomfort in having to face his daily routine and social obligations alone. He is like a child in his helplessness, crying for a lost lollypop but unable to make any constructive effort to fill in the gap.

The process of progressive re-distribution of interest-energy and the replacement of infantile values goes forward satisfactorily, given reasonably favorable conditions, just as physical growth proceeds under comparable reasonably favorable conditions. The period of infancy and preschool growth is tremendously important as the foundation for later healthy mental development. The parent is the strategic person in either promoting or inhibiting an early healthy mental growth process. One can hope for a gradual progressive learning of new ways of finding satisfaction and the progressive replacement of values from period to period during growth, only under conditions which permit a reasonable freedom for independent activity and experimentation.

Interference in the form of over-protection, over-solicitous and fearful attitudes for the growing child, unwise emphasis and conflict over health routines, repressive discipline, all tend to reinforce infantile self-values and

prevent adequate growth in the direction of emotional independence, emotional self-control and intellectual progress as these increments in growth and learning are marked by increasing self-confidence and fortitude in the face of difficult situations and disappointments, patience in the face of failure and thwarting and the acquiring of satisfying new skills and knowledge. The individual learns and grows by doing. If his spontaneous expression and experimenting is thwarted through repressive interference of whatever kind, or if his satisfaction from his own effort is consistently overshadowed by adult approbation or disapproval, there is a maintenance of infantile values and forms of satisfaction which does not promise well for a later healthy independent adjustment and a satisfactory, satisfying assumption of adult responsibilities.

The best single criterion which we have for healthy mental growth is in terms of this progressive re-distribution of interest-energy and in cross-section at any chronological level; our best single criterion for mental health is in terms of how completely the individual's interests and energies are distributed constructively, that is, in ways which are personally satisfying and socially acceptable. When we find individuals who, on the one hand, are behaving in ways which are ineffective and socially unacceptable or, on the other hand, whose behavior responses and interests lack reasonable balance and diversity—even though they be essentially acceptable—we should recognize the fact that we are dealing with persons who do not represent good mental health risks and in whom, given reasonable potentials, mental growth toward an adequate balance and adjustment, has not proceeded satisfactorily.



——Curve showing ideal normal distribution of interest-energy in personally satisfying, socially acceptable ways.

----Curve showing unhealthy distribution of interest-energy, where interest remains too closely related to infantile self—marked by such behavior characteristics as

Dependency, sensitiveness, emotional instability, day dreaming, fearfulness, shyness. and later Fears, phobias, feelings of inferiority, hypochondriacal complaints, social isolation, etc.

A—Infancy, early self-centered, auto-erotic period.

B—Pre-school period.

C—Transition period between home and larger social group, represented by school.

D—Pre-adolescent period.

E—Puberty—later auto-erotic period. Marked by self-consciousness, sensitiveness, slump in outside activities and performance, *e.g.*, school performance, and determined by physical changes of period.

F—Later adolescent years, with redistribution of interest to outside things—social interests, recreational and vocational interests, mating or hetero-sexual interests.

The emphasis of the public health program must be on the growth process, insuring so far as is possible conditions under which growth may proceed in a healthy fashion. The integration of a mental health approach implies that the personnel of health departments shall be familiar with: (a) the way in which mental growth proceeds; (b) the factors which favor and the factors which interfere with healthy mental growth; (c) behavior responses at all points in the developmental period or in the adult periods which suggest significant deviations from healthy mental growth or mental health; (d) the place of inheritance in relationship to mental disorder since much of the general public's fear and misunderstanding of mental disease is based on misconceptions of the part played by heredity; (e) the laws of learning. Inasmuch as it is impossible to project an adequate program of health education without some knowledge of how learning takes place, the emotional factors which are involved, the satisfactions, resistances, and fears which are aroused in the presentation of new material, and the adjustments of which are more important than the simple acquirement of new facts. For example, around such learning as has to do with the establishment of health habits in relationship to such functions as eating, sleeping, and elimination—public health teaching, in its desire to see these habits established for the growing child, has emphasized their importance to the point that a destructive over-concern and anxiety has been set up in the minds of parents.

In public health teaching we have frequently overlooked the learning principle that an accompanying emotional satisfaction is an essential for all good learning. The parent, in expressing anxiety and in the urgency to secure adequate health habits, may make around this training a battleground which not only defeats the immediate purpose of the teaching but which is a seriously interfering factor in other aspects of mental growth. Again because of their own unresolved conflicts, parents and other adults are frequently quite unable to use in a reasonable fashion the factual material which we might include in a health program. We have recognized in our approach to parent education or teacher education, the importance of helping these adults to some re-adjustment of their own attitudes and misunderstandings rather than just being satisfied with handing them factual information which they may or may not be able to use wisely.

SUMMARY

In this rather general presentation, dealing with the integration of mental hygiene in a public health program, I have attempted to indicate that:

1. Any program of public health and preventive medicine to be adequate must approach its problem with the premise that physical and mental aspects of health represent one single complex state of adjustment. That the individual in all his responses is a "reacting whole." Any program of therapy or prevention which does not adapt this approach lacks effectiveness and balance in much the same way as a boxer with one hand out of action.

2. The approach to mental disease prevention does not differ in any respect from the approach to general health and preventive medicine.

3. The emphasis in any program for mental health must be on safeguarding the "growth process." In guiding the process of mental growth, our objectives are: (a) emotional maturity in terms of emotional independence and emotional self-control; (b) intellectual maturity. Failure in securing through growth an adequate degree of emotional maturity leaves us with individuals who are poor mental health risks.

4. The public health group at the moment is in a vulnerable and at the same time in a strategic position. They cannot afford to

overlook an aspect of health effort as inclusive as that to which they have been giving the major part of their attention—at the same time they are in a position to make a contribution which promises more in the way of returns, over the next decade, than perhaps any other development in the social or medical fields.

The Impact of Science Upon Society

. . . But not alone economics: if the impact of science brings certain evils they can only be cured by more science. Ordered knowledge and principles are wanted at every point. Let us glance at three only, in widely different fields: man's work, man's health, man's moral responsibility. The initial impact of new science is in the factory itself. The kind of remedy required here is covered by the work of the National Institute of Industrial Psychology. Some of this improves upon past conditions, some creates the conditions of greater production, but much of it combats the evils arising from new conditions created by modern demands, speed, accuracy, and intensity. It invokes the aid of many branches of science. It is the very first point of impact. Yet its finance is left to personal advocacy, and commands not 10 per cent of the expenditure on research in artificial silk, without which the world was reasonably happy for some centuries. We can judge of the scope of this by the reports of the Industrial Health Research Board. Again, the scientific ancillaries of medicine have made immense strides. Clinical medicine as an art makes tardy, unscientific, and halting use of them. The public remains as credulous as ever, their range of gullibility widened with every pseudo-scientific approach. (We do not know what proportion of positive cases can create the illusion of a significant majority in man's psychology, but I suspect that it is often as low as 20 per cent.) For a considerable range of troubles inadequately represented in hospitals, the real experience passes through the hands of thousands of practitioners, each with too small a sample to be statistically significant, and is, therefore, wasted from a scientific standpoint.

Half-verified theories run riot as medical fashions, to peter out gradually in disillusionment. If the scattered cases were all centralized through appropriately drawn case histories, framed by a more scientifically trained profession, individual idiosyncrasy would cancel out, and mass scrutiny would bring the theories to a critical statistical issue of verification or refutation in a few months. This would be to the advantage of all society, and achieve an even greater boon in suggesting new points for central research.—Sir Josiah Stamp, The Impact of Science Upon Society, *Science*, Sept. 11, 1936, p. 239.

Recent Advances in the Control of Pneumonia*

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WITHIN the lifetime of the older members of this audience one of the principal causes of death in the English bills of mortality was "fever." Under this term were included not only typhus and typhoid fever but probably also many cases of meningitis and miliary tuberculosis, to say nothing of the various forms of paratyphoid, dysentery, and other acute infections of the intestinal tract. Although some progress in the prevention of certain of these diseases had been made before an etiologic classification was possible, it was only following the discovery of the causal agents that there occurred the great advances in prevention that are now hailed as triumphs of modern organized public health.

In the light of what has been accomplished in the control of the so-called intestinal infections, it is astonishing that almost no effect has been produced on the prevalence of acute respiratory diseases or on the associated mortality. Indeed, notwithstanding the vast army of health workers that has been mobilized to fight disease, and the expenditure of enormous sums of money for public health, there occurred only a few years ago, the greatest pandemic of acute respiratory disease that the world has ever seen, with an unprecedented loss in human lives. Each year in many regions there now occurs a greater loss of life from acute pulmonary infections than ever resulted from typhoid fever, even in the worst epidemic periods.

These facts deserve the most serious consideration of those guarding the health of the people. Is this condition due to lack of knowledge, to the indifference of health authorities, to ignorance of physicians, or to all of these factors combined?

In my opinion, a most important obstacle to progress in this field has been the employment of the term "pneumonia," which implies a specific infectious disease, but which really covers all forms of inflammation of the lungs. So long as "fever" was a reportable disease, no progress could be made in preventing typhoid and allied conditions. So long as the attempt is made to control "pneumonia," the results are bound to be futile.

For pneumonia is not one disease but is a group of diseases, each with a specific etiology. General sanitary measures could have and did have some effect in the prevention of diseases like typhoid and typhus. We know of no such measures that can influence acute infections of the respiratory tract, and all the efforts to decrease the prevalence of dust, to

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diminish crowding, to prevent sneezing, to lessen susceptibility by consuming vitamins, by avoiding fatigue or overdrinking, have had little or no effect. The attack must be directly or indirectly on the specific infectious agents themselves.

As long as it was believed that pneumonia was due to pneumococcus, an organism widely distributed in nature, present in the mouths of the healthy as well as the sick, the problem indeed seemed hopeless. What could be accomplished in the way of prevention of intestinal infections if typhoid bacilli, all the paratyphoid bacilli, and the various kinds of dysentery bacilli were considered identical, and also identical with the colon bacilli inhabiting the intestinal tract of healthy persons? As a matter of fact all these microörganisms *are* closely related in form and function, and very careful laboratory procedures are required to differentiate them. The discovery, therefore, that pneumococci are not all alike, that there are a number of varieties and that those causing the most serious and most common forms of acute lung disease are not widely distributed, was of great significance.

A second great obstacle to advance in this field was raised during the last century following the development of pathologic anatomy and the introduction of methods of auscultation and percussion, when a classification of acute pulmonary disease on an anatomical basis was attempted, and the recognition of the various forms by the methods of physical diagnosis became the chief interest of physicians. If all the time that has been spent by doctors in efforts to determine the exact portion of the lungs involved in cases of acute pulmonary infections had been spent in detecting the etiologic agents concerned, many lives might have been saved. Even pathologists with the tissues before them, are in many cases unable to say whether the condition from which the patient suffered was broncho or lobar pneumonia. From the public health standpoint these anatomical diagnoses are not only useless but are misleading, for within very recent years in the English mortality tables the deaths ascribed to bronchitis are almost as numerous as those in which the diagnosis is pneumonia. A second great advance has been made, therefore, by the discovery of methods by which the causal agent in every case can be readily determined and the cases thus classified etiologically. It happens that these methods involve laboratory procedures, but let us remember that typhoid fever and the various forms of paratyphoid can also be differentiated only by laboratory methods.

It is impossible today to discuss in detail the matter of terminology, though this is of much significance, for as Faber has said, the physician "cannot live, speak, or act without the concept of morbid categories" and, we may add, no more can the public health worker. Even if it were desirable, it would be impossible to overthrow entirely the terminology now in use, but it would add greatly to progress if the term "lobar pneumonia" were confined to the designation of those cases of acute lung infection which present the clinical features that have been considered characteristic, and in which the etiologic agent is pneumococcus. The particular variety of the disease may then be designated by the type of pneumococci concerned and Type I pneumonia becomes the name of a definite and specific disease, as specific as is typhoid fever. Since Type I pneumonia and Type II pneumonia together constitute 60 per cent or more of all cases of lobar pneumonia, they present the outstanding immediate

problem as regards control of this group of diseases.

A further great advance in knowledge has consisted in the discovery that not only can animals be highly immunized against pneumococci of the same specific type, but that the serum of these artificially immunized animals, when injected into susceptible ones, may render the latter resistant, and still more important, if injected promptly and in large amounts into animals that have already been infected will cure them.

Another advance in knowledge has consisted in the discovery that pneumonia is rarely a primary disease. During the World War when acute respiratory diseases were so prevalent, it was found that most cases of pneumonia followed or were associated with measles or influenza. Experience since then indicates that in most cases of pneumonia the onset is preceded by a cold of longer or shorter duration, or by influenza-like symptoms. The sudden onset of pneumonia in a person previously perfectly well is only another textbook fairy tale; in my experience it rarely happens in real life.

Dochez and his collaborators have shown that colds, at least those of certain varieties, are due to filterable viruses, and Laidlaw and Andrews in England, and Francis in this country have similarly presented evidence indicating that filterable viruses are also responsible for influenza, at least for that occurring in interepidemic periods. Francis has also developed methods by which active immunity in man to the influenza virus can probably be produced.

Now, how can all this new knowledge be used in attempts to lessen the ravages of acute pulmonary infections? The first step in all efforts of this kind must consist in detecting and diagnosing each individual case and thus determining the frequency of occurrence of cases of the various kinds. Paraphrasing a remark of Benjamin Wood, "Pestilence must not walk in the dark. It must be measured and registered and walk at last in the open day." The methods for accomplishing this in the case of the acute respiratory diseases are now available. It remains for physicians and public health authorities to employ them.

Efforts at prevention may be directed toward the chief predisposing factor, in this case the preceding upper respiratory infection, or toward limiting the spread of the infectious agent itself, or, in lieu of this, rendering the population immune by means of artificial immunization. While the discoveries that colds and influenza are due to filterable viruses, are of great significance, methods for applying this knowledge in the prevention of these conditions have not yet been established.

It is possible, however, to prevent the spread of pneumococci from the sick to the well, at least in Type I and Type II pneumonia. It is now known that organisms of these types are not widely distributed. They are present in the mouths only of those suffering from pneumonia of the respective types except occasionally in the mouths of persons closely in contact with these patients, and then for only short periods of time. They may also occasionally be isolated from objects in the immediate surroundings of patients, or from the dust of rooms occupied by them. These facts and the results of studies of family and local epidemics indicate that Type I and Type II pneumonia are usually spread by direct transfer of the infective agent from the sick to the well.

Prevention of the spread of typhoid was long delayed by insisting that typhoid fever was an infectious, but not a contagious, disease. We must begin

to recognize that Type I and Type II pneumonia also are contagious diseases. It is true that isolation of patients has not been the measure principally responsible for the prevention of intestinal diseases; yet it is possible to limit and even stop the spread of typhoid fever by early diagnosis, isolation of patients, and careful disposition of all excreta. This was clearly demonstrated by the State Board of Health in Michigan in 1901, and by Koch in early studies carried out in Trier. More than 20 years ago at the Hospital of the Rockefeller Institute we began isolating all cases of pneumonia, disinfecting all sputa and other excreta, and insisting that doctors, nurses, and all persons coming in contact with these patients wear masks and gowns. It is not likely that masks form an effective barrier to the spread of infection, but they serve as a constant reminder to everyone that at least certain kinds of pneumonia are acute, specific, infectious, contagious diseases.

At present no conclusions can be drawn with regard to the effectiveness of artificial immunization. Few extensive experiments have been made with this method and they have been complicated by extraneous factors. The outlook in this direction is by no means hopeless but at the present time the chief reliance in the field of prevention must be placed on isolation of the patients.

On the other hand, it is now quite certain that much may be accomplished in reducing mortality from the severe pulmonary infections by suitable treatment. In the hospital with which I am associated, we have studied during the past 25 years, practically all forms of nonspecific treatment which offered any prospect of being valuable. Certain measures, such as the administration of oxygen and drugs to relieve special symptoms, have been found valuable, but even if employed with all possible skill, it does not seem that they can have a very marked effect in reducing mortality rates.

The situation is quite different, however, as regards specific treatment. During 1911 and 1912 extensive clinical and experimental studies on pneumonia were conducted in the Hospital of the Rockefeller Institute. It became evident that serum treatment of Type I pneumonia would probably be useful, provided the serum were given early and in large amounts. A horse was immunized against Type I pneumococci and serum was collected. On January 18, 1913, Ernest Schaffhouser, a sailor suffering from Type I pneumonia of 2 days' duration, was admitted to the hospital. The same day at 2:30 in the afternoon, 100 c.c. of the immune horse serum were injected into a vein of his arm. Two hours later he said he felt much better; the symptoms were obviously improved. Eight hours after the first injection he was given a second one of the same size. The next morning his pulse and temperature were normal; he was well. To make the cure certain he was given a third similar injection. Twenty-three years ago this was heroic treatment!

From that day to this practically every patient suffering from Type I pneumonia admitted to this hospital has been treated with serum, always insisting that the serum be type specific, that it be given as early as possible, and that it be administered in large amounts. In certain other places various subterfuges have been employed in order to avoid strict adherence to these principles. Serum has been given in small doses; it has been given indiscriminately to patients with pneumonia regardless of type; polyvalent serum has been used; great efforts have been made to reduce the amount of fluid injected, by employing

extracts or concentrates said to be 20 or 30 times as active as whole serum. In spite of all these substitutions and neglect of the underlying principles, however, convincing evidence has gradually been accumulated by various observers which shows that Type I serum is curative, and fortunately the day has now passed when it is necessary to urge this point.

It is not sufficient, however, that patients be simply treated by the administration of Type I serum; of great importance is how they are treated. As the animal experiments indicated, treatment should be commenced early, and prompt diagnosis is therefore of great importance. In my opinion physicians have made the diagnosis of pneumonia too difficult. They too frequently wait for the physical signs of consolidation to appear. As a matter of fact, to the experienced observer, the symptoms at the onset of the disease are almost pathognomonic. Most patients *threatened* with pneumonia *have* pneumonia. When, either with or without preceding respiratory symptoms, the patient has a chill, fever over 102°, cough, sharp pain in the chest, rapid respirations, and above all when the sputum is blood tinged, this person in the great majority of cases, has pneumonia. In all such cases the sputum should be examined without delay, and if pneumococci are present, particularly if they are of Types I or II, there can be little doubt about the diagnosis.

The laboratory worker should consider the examination of the sputum an emergency measure. It should not be delayed until the next morning or until other work is out of the way, and the physician should be notified by telephone or telegram immediately after the diagnosis is made.

As soon as it is determined that the patient is suffering from Type I pneumonia, serum should be administered. There should be no waiting to see whether the patient will not be better in the morning; it should not be delayed because he does not seem sick enough to justify giving serum; or it should not be decided that "it is too late," that "he is too far gone for serum to be of any use."

The only exceptions we have made in administering serum have been in an inconsiderable number of children who were not very ill, since most children with lobar pneumonia recover; second, in patients who were moribund on admission and died before the serum could be administered; and third, in patients who were obviously in the stage of recovery when admitted.

All other cases have been treated as soon as the diagnosis was made. This is of importance because some of those employing serum have recommended that it be used only in cases that can be treated as early as the 3rd or possibly the 4th day. It is true that the earlier in the disease it is used, the greater is the effectiveness of the serum, but our experience indicates that no patient, however late he is seen, should be deprived of the benefits of this measure. In our series, the mortality rate in cases treated during the first 3 days was 4.8 per cent, in those treated on the 4th day or earlier, 8.2 per cent, on the 5th day or earlier, 8.6 per cent, and in those treated after the 5th day 19.5 per cent.

Until 3 years ago, whole serum in doses of 100 c.c. was administered; since then concentrated serum has been employed, not in doses of a few c.c., but in 15 to 30 c.c. doses. The greater ease of administration of the concentrated serum is obvious. In addition, the frequency of immediate and febrile reactions is probably less. Probably the greatest value in using the concentrated serum consists in a decrease in

frequency and severity of the symptoms of serum disease. With present knowledge, however, there is no way in which these unpleasant but harmless symptoms may be completely avoided. After all, in a very serious disease like Type I pneumonia, from which, unless serum be administered, 1 patient in every 4 dies, a few days of itching of the skin and pain in the joints is not too high a price to pay for restoration to health.

The complaint is sometimes made that after all, serum treatment is possible in only a part of the cases of pneumonia, and attempts are made to treat all cases of pneumonia, either with Type I serum or with so-called polyvalent sera. One might as well argue that it is useless to treat patients suffering from diphtheria with serum, because this treatment is not also effective in cases of malignant streptococcus sore throat.

Much stress has been laid upon the possible dangers of violent reactions. There are some risks but we now know how to avoid them. That disastrous results did not occur when we first began using very large amounts of serum intravenously, when we did not know the dangers or how to guard against them, shows that the dangers are not too great. By making preliminary tests for serum sensitiveness, by proceeding very slowly in the first injections, and by prompt use of adrenalin in case any symptoms occur, the possibilities of serious complications are almost entirely avoided.

Opinions differ as to the effectiveness of Type II serum. Our own early experience was not very favorable and we decided to give our entire attention to the treatment of Type I cases. The more recent statistics are a little more promising. It is possible that this serum may still be improved, and where the very best serum is available it is even now justifiable to employ it in the Type II cases. On the other hand Type III pneumococci differ so fundamentally in their immunological properties from pneumococci of Types I and II that at present it does not seem advisable to attempt to treat patients suffering from Type III infection, with serum.

The pneumococci previously designated as belonging to group IV have now been divided into a large number of types, which have been numbered consecutively from V to as many as XXXII, and there may still be others. Certain pneumococci of these types, notably V, VII, and VIII, have been found to be responsible for a not inconsiderable number of cases of lobar pneumonia, though of course relatively a small percentage of the total cases. Sera have been produced by several commercial firms and public health laboratories against pneumococci of certain of these types. Especially in Type VII and Type VIII pneumonia a considerable degree of success in treatment has been obtained, though the experience is still too limited for final conclusions to be drawn. At present the main dependence must be placed on treatment with Type I serum, and since the number of Type I cases is so large and the serum so effective, the saving in human lives by the proper use of this form of treatment is bound to be considerable.

In the light of the evidence which I have briefly presented it seems that public health authorities are not only justified in attempting to limit the spread and decrease the mortality resulting from acute pulmonary infections, but that it is their duty to do so.

To be effective this work will require extensive organization and continuous effort and it will demand the coöperation of physicians with the health organizations. The campaigns now being

conducted in Massachusetts and New York State are providing experience as to the best methods of procedure. The campaign cannot be merely one of education. Active steps will have to be taken by public health authorities and these must consist, (1) in providing laboratory aid so that all cases may be accurately and promptly diagnosed; (2) in arranging for the proper registration of all cases and in carrying out epidemiologic studies; (3) by educational measures providing for proper isolation of patients; (4) supplying serum that is of maximum strength; and (5) assisting in the prompt and proper administration of the serum.

Too much must not be expected immediately in the way of decreased incidence and lowered mortality rates. Years of effort have been required to control typhoid fever and diphtheria. Such campaigns, like avalanches, gather momentum and increased power as they proceed. The institution of efforts by public health authorities will spread information concerning these conditions among the medical profession and the laity, will lead to increase of knowledge concerning the epidemiology of the disease, and will stimulate investigation into the details of the infective process and of the nature of immunity. It is indeed on the results of these investigations that we must ultimately depend for methods which will permit the complete control of this group of infections. Let us hope that the public will give the needed support; and may the time be not too distant when the deaths from "pneumonia" as recorded in our statistics will be as infrequent as are now the deaths from "fever," when as few persons will die from Type I pneumonia as now die from typhoid, and when we can look back at the triumph over acute pulmonary disease with the same satisfaction with which we now regard the victories over acute infections of the intestinal tract.

Using the Truth We Have

NOTHING in science is more laborious than the clarification of the factors which influence health. Human environment is so complex, man himself is so complex, and his powers of modifying himself to suit altered situations so great that it is only by prolonged observation and experiment, constantly evaluated, that we ever approach the truth. This, however, is no excuse for not using the truth when we have got it. Here indeed we may justly complain; but let us be sure that the fault does not lie with those who are able to use the truth.—Dunstan Brewer, D.P.H., *Ann. Rep., Medical Officer of Health for the Year 1935,* Borough of Swindon, p. 8.

Recent Advances in Administrative Technics*

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WE convene annually as Fellows and Members of the American Public Health Association because we have chosen as our life work the profession of sanitary science, dedicated to the improvement of the health, welfare, and happiness of mankind. Of no group can it be more truly stated that it is the combined product of heredity and environment and, like most humans, we find ourselves blessed with kindly and helpful characteristics but at the same time burdened by obsolete and ill-founded theories and practices. Fortunately, in our case, the inherited concepts may be cast aside without awaiting a new generation.

Early health programs considered the whole community because they were environmental. Witness the elimination of the exotic plagues of typhus and cholera, and the rapid control of typhoid and other filth-borne and water-spread diseases. The intermediate era concentrated efforts on the common communicable diseases, and made programs in terms of the lowest group in the community. This period was short-lived and disappointing because of the failures in quarantine and isolation, and the unwillingness of disease as well as physical and mental imperfections to recognize any class, social or geographic distinctions. Present-day plans must consider all classes because education and not service is the basis for work.

There is an ever-changing philosophy of the administration of public health. Health departments were born in the nauseating, offensive airs and vapors of the open sewer which gave forth its lethal gas; in the miasmal emanations from the deadly swamps and marshes; in the esthetically disagreeable associations of the garbage dump. But today, well beyond the life giving age of 40, we find many a public health department still smugly complacent and making little or no effort to extract the public health budget from the garbage fund. We who become self-satisfied and unwilling to travel with the tide of scientific progress, are doomed to destruction. Public opinion and smartness will rapidly expose our weaknesses, and demand for the advantages of modern health service will force our retirement. We have bemoaned the want of opportunity and the lack of funds, but the increasing availability of federal funds through the U. S. Public Health Service and the Children's Bureau now presents a potent challenge.

The outstanding need is for the establishment in every local area, whether city, county, or district, of a full-time public health service under the direction of a health officer sympathetic

* Read at a Special Session of the American Public Health Association at the Sixty-fifth Annual Meeting in New Orleans, La., October 20, 1936.

to the viewpoint of community-wide participation, one who can understand the advantages of weaving into his program the more or less latent potentialities to be found in the lay, the professional, and the teaching groups. Not only should the health officer be a man of experience and training, but his responsible subordinates should have a corresponding training in their special fields of activity. There should be, in addition to the public health administrator, the necessary professional, technical, public health nursing, engineering, laboratory, and educational assistance. The lack of funds, as well as the want of lay appreciation of the results to be obtained, has prevented more rapid progress, but now, with the assistance of the federal government and the states, local health organizations are being developed more rapidly. At the end of 1935 the U. S. Public Health Service reported that 612 counties in 32 states had whole-time county or district health services, an increase of 71 units over 1934. During 1936 progress has been more marked, and states like North Dakota, Wisconsin, and Indiana, have established their first county health units with the aid of state and federal funds. Available records in the Surgeon General's office as of July 1, 1936, indicate a total of 820 counties under full-time health service, distributed among 39 states.

The health commissioner as the administrator and leader is the key man in the community health organization. The responsibility demands real leadership. Not only must the health officer possess a basic training in public health science and a willingness and ability to work effectively with lay and professional groups, but he must also possess at least two essential characteristics:

The health director must have the ability to study and see clearly his own program in relation to local problems and needs, to the end that his program will develop the most effective use of personnel and funds at his command. While it is true that there are certain fundamental essentials to all well balanced public health programs, there has been too great a tendency to standardize, to routinize local health programs, especially in methods of approach in health education and in the provision of preventive medical services for individuals at various economic levels. Too many health officers adopt a certain type of program simply because someone else has that type of program. Some of the outstanding health departments of this country—Milwaukee, Baltimore, New Haven, and Syracuse—have been successful because they have not followed the other fellow's plan but rather have developed their own in the light of their own problems and possibilities. Let us not forget that local problems and local possibilities are not necessarily synonymous.

Educational groundwork must precede corrective action, especially when the pocketbook is affected. Surely, no individual desires to die prematurely, and no sane person wishes to be responsible for the death of another. Nevertheless, the health officer who boldly invades a community which has not benefitted by an educational program establishing in the lay mind the relation between impure milk and the death of babies, will literally be driven from his home and family if his first official act is to require universal pasteurization of milk. The need of this safeguard is apparent to every sanitarian, but the health official must not travel too far ahead of public opinion, especially when local pride is affected. Contrariwise, the health officer who questioned the desirability of 100 per cent pasteurization in Boston or Cincinnati would be guilty of official suicide.

Capable leadership on the part of the health officer involves the development of services which, with the exception of research work, will show measurable, demonstrable results within a reasonable period of time.

The health director must have the ability to develop a morale—an *esprit de corps,* in his own organization. He should be able to imbue his personnel with the feeling that each individual's work is important and worth doing and that each who does his or her work well will find self-satisfaction in the knowledge that his work has added materially to the health and happiness of the people of his community. There is nothing sadder than the public health nurse or sanitary inspector who sees nothing but a day's work in his job. The health officer who is a leader should supervise, guide, and stimulate, but at the same time permit the free play of each individual's own creative ability. Thus is real progress achieved. Frequent staff conferences are especially helpful in the development of teamwork. An outstanding medical school is directed by the teamwork of a qualified faculty rather than an autocratic dean. Group thinking among executives which comes from discussion prevents individuals from carrying on little shows of their own which are inimical to each other and preserves a solid front to the public. The entire health department personnel should be kept informed regarding the major objectives to be obtained. Incidentally, the administrator may then rest assured that the general policies, understood by all his staff members, will be continued while he is absent on vacation.

The health education program should be built around the soundness of the department's policy and not around the fanfare and ballyhoo of the health officer. The late Enion Williams, for many years the distinguished health commissioner of the State of Virginia, was asked to what he attributed his long tenure of office. The reply was to the effect that he had always submerged his own personality and name in an endeavor to establish a widespread public confidence in the work of the State Health Department.

While, with the expansion of human interest in disease prevention, there has developed an increasing willingness of individuals and communities to support health organizations, there still remains the need of conserving to the utmost the relatively limited funds which can be expended in this field. Frequent, well thought out tests of the effectiveness of procedures are becoming more common each year. While the cause of public health is being aided measurably by the availability of Public Health Service and Children's Bureau funds, we should bear in mind that these funds will quickly "dry up" unless we not only make effective use of them but also show an increasing willingness to assume locally our fair share of financial responsibility for providing essential health services. On the other hand, we cannot expect adequate local financial support until specific local health education has been successful in persuading a substantial portion of our people that public health protection is worth purchasing.

We have long complained of the lack of trained personnel and have too frequently been satisfied with employment of mediocre and unprepared assistants, many of whom have been thrust upon us by political pressure. Our fellow health workers employed by the nonofficial agencies not infrequently look down upon the official health department personnel with a certain degree of scorn and, unfortunately, in too many instances there has been justice in the assumption of such an attitude. Low requirements and standards establish a

low level of service in public agencies. Now, do not misconstrue my meaning —I am not directing these remarks at all health departments. Nevertheless, every one of us has knowledge of the existence of conditions such as I mention.

In the employment of public health nurses some health officers seem to take the attitude that the completion of a hospital training course involving its hours of drudgery and maid service qualifies any nurse to enter the field of health education. We need something more than the reception of a new recruit, welcomed by a broad administrative smile, and waved with the friendly thrust of a shoulder into the adventurous field of family education. The National Organization for Public Health Nursing has striven diligently to impress us with the need of employing trained personnel. The very least that we, as health officers, can do is to strive toward their excellent standards as a goal. In most communities the early adventures in promotion of health education through the employment of public health nurses were started by the ever alert private agencies who saw the possibilities of reducing the tuberculosis death rate; of cutting down the high mortality of infancy; of establishing safeguards for the expectant mother; and, in general, carrying the message of good health to the public. Quite properly, as time proceeded and as there was engendered in the public mind a consciousness of the value of these services, cities and counties assumed their rightful responsibility and began to employ nurse-educators. In so doing we have not always adhered to the standards set by our predecessors.

Now we are faced with that golden opportunity, offered by the Public Health Service through regional schools of public health to strengthen the training of our present personnel, employ the qualified health educator, statistician, laboratorian, and public health engineer. Incidentally, it is more economical to employ young sanitary engineers rather than untrained politicians as health inspectors. The turnover among them is greater but they bring a freshness to the service which prevents it from becoming perfunctory. The same is true with other trained personnel.

It is ill advised for the health officer to isolate himself from community interests, especially the medical profession. Unwarranted suspicions have developed on each side. Recognizing the desirability of family-physician participation in a community health and welfare program, it is essential that every private physician should be thoroughly conversant with the newer technics and procedures which aim to prolong human life. He must familiarize himself with the technics for diphtheria protection, with current knowledge regarding whooping cough and scarlet fever; he must be well acquainted with the tuberculin test and the roentgen findings which reveal suspicious tuberculosis; he must know the syphilis problem; he must be alert to the significance of the abnormalities which lead to cancer, cardiac disease, and the degenerative diseases of middle and late life. Briefly, he must be conscious of the part he can play in discovering such imperfections in human life, and provide the means of their prevention or alleviation.

In spite of the remarkable reduction in death rate, tuberculosis causes 3 times the deaths of all common communicable diseases in children, and retains first place on the mortality tables in young adult life. We recognize the value of such community facilities as clinics, both diagnostic and treatment, hospitalization of infectious cases, provision for open window and

open air schools, camps and preventoria, control of sanitation and milk pasteurization; but we can truly hide our faces in shame when we examine our case finding facilities. The *Appraisal Form* of our Committee on Administrative Practice offers a perfect score if 20 per cent of notifiable cases are minimal. I venture the opinion that not half a dozen major cities have even reached this goal. Are we to remain complacent when 4 out of 5 of all tuberculosis cases first coming to our attention are moderately or far advanced? We could never expect to arrest the progress of a typhoid epidemic if we knew only of the dying cases.

Our tuberculosis case finding and epidemiological services are still of a primitive character. We are losing an opportunity to render efficient service to the public through prompt isolation; we fail to serve the patient with modern treatment and we fail to enhance his opportunity for complete recovery and return to usefulness as a wage producing citizen; we continue the extravagant expenditure of public funds to hospitalize the advanced case. The period of hospitalization and the cost to the individual or taxpayer can be halved by finding the minimal case rather than delaying until the patient has developed tuberculosis in a more advanced stage.

Why not boldly endeavor to increase the proportion of early cases to at least two-thirds of those reported to the health department? Save the dollars in our hospital budget by expending one-tenth the sum in the preventive technics of early case finding. How better can this be accomplished than through the coöperation and participation of the family physician? It is he who most frequently observes the early signs of disease and, he must become conscious of the central part which he must play in the tuberculosis as well as all other phases of the preventive medicine program. First, he must realize that early diagnosis requires a tuberculin test and roentgen examination of the chest. Night sweats, cough, fever, loss of weight or appetite, and hemorrhage are not diagnostic of minimal cases. Then, he must share with the health department the responsibility of searching for and examining contacts to known cases of tuberculosis; in routinely testing school children of a selected age or grade; in systematically canvassing certain geographic and racial groups among whom tuberculosis presents an unusual problem. The office of the practising physician must become a House of Health, closely linked directly as well as indirectly through the local medical society with the health department. Such office is a health center to which the layman may go with confidence that he and his family will receive the full advantages of modern medicine. The alert physician will not overlook this unique opportunity to spread the gospel of personal hygiene and utilize the recognized technics of health education.

Postgraduate medicine is no innovation, but the establishment of refresher courses in preventive medicine is rather a new development. Such undertakings have been sponsored in recent years by the W. K. Kellogg Foundation, the Commonwealth Fund, certain state health departments—notably those of Massachusetts, Mississippi, and Virginia — Vanderbilt University, the Michigan State Medical Society, the Detroit Department of Health, and other organizations. Their influence in promoting child health through the family physician is now well recognized. Unfortunately, however, there are many physicians, especially in the large cities, who are not wont to attend post-

graduate courses. They do not belong to hospital staffs nor are they members of the local medical society. The layman, in his ignorance, may not discern between the qualified coöperating doctor and the one who practises in the shadow-lands of pseudomedicine.

It behooves the health officer to see that each licensed physician is thoroughly conversant with the plans of the public health program and has learned the technics and the interpretations of the medical services. A medical coördinator to cultivate the relations with professional groups, to visit physicians and dentists in their own offices, to demonstrate there, as well as before society meetings, the significant tests, to carry the educational program into undergraduate medicine, is becoming an urgent need for every modern health department. In small organizations the health officer may serve in this capacity; in a large city there should be a full-time deputy commissioner appointed as director of medical relations. Such an individual has just been chosen for the Detroit Department of Health. We expect through his aid to stimulate an ever increasing interest in the practice of preventive medicine by the family physician.

In order that the advantages and the availability of these services may be known to the laity, it is essential that public health departments and allied organizations conceive and conduct well designed and executed programs in health education. The tools of popular health instruction, involving the spoken or printed word, the radio, printed literature, talks before various lay groups, and other technics too numerous to mention, have been effectively employed in innumerable instances. In addition to this, there is need for more intensive use of trained personnel in the field of individual health education. For this purpose the well trained public health nurse can be of great service. Evidence of the effectiveness of this type of coöperation is found in every modern health organization.

In those communities where sympathetic health officer and medical profession coöperation is forthcoming there is evidence that services are being dispensed in an ever increasing quantity by the family physician. For example, in the city of Detroit, all the diphtheria prevention treatments are being given by the family physician and three-fourths of these are being paid for by the parent. Each year the percentage of preschool children protected has increased until now 60 per cent are known to have received such service. In 7 * typical rural counties in southwestern Michigan the county health departments, in coöperation with the W. K. Kellogg Foundation, have established the most highly developed participation program with the physicians, dentists, school teachers, and other local educational facilities. Here it may truly be said that professional men are conscious of the opportunities of preventive medicine and the public is being taught where to secure the advantages of such service. There seems to be an increasing appreciation on the part of parents that preventive medicine is a purchasable commodity and that when the family purse will permit, it should be purchased the same as any other essential of life, such as food, fuel, or shelter.

I fully realize that I have added nothing particularly new in the field of administration technics, but I have endeavored to re-assemble some of the opportunities which we possess to strengthen and enrich our community health services with a view to increasing the health, welfare, and happiness of mankind.

* Allegan, Barry, Branch, Calhoun, Eaton, Hillsdale, Van Buren.

Bacterial Limitations in Ground Fresh Meat

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DURING the fall of 1933 we sought to determine the bacterial value in testing the wholesomeness of ground fresh meat, especially hamburger.

This was occasioned by the fact that numbers of people were complaining that this type of food, which they had purchased, was off flavor, if not actually spoiled. Our city ordinance provided penalties for the selling of "unwholesome" food. We were, however, handicapped by difficulties found in defining the meaning of "unwholesome." One case involved the need of expert testimony which we could obtain only at considerable expense. The experts themselves were put to considerable trouble as two of them had to travel between 50 and 75 miles, losing time which could hardly be compensated for by money. It was certain that such a method could not be made practical.

The ground meat, or hamburger as it was called, involved in this case, showed a bacterial count of 85,000,000 per gm. It was unquestionably bad. The court so found and levied a fine of $50.

It could be plainly seen from this that if we were to cope successfully with this problem some simple method must be devised. The question confronting us was this: Was there a certain bacterial development which could be depended upon as indicating a generally recognized state of unwholesomeness? Our tests appeared to show that there was.

COLLECTING SPECIMENS

The method employed in collecting the evidence was very ordinary. Specimens were obtained by inspectors by purchase, it having been decided that this presented the true side of the problem as it affected the consumer. When questionable delay was involved, specimens were packed in ice until delivery to the laboratory. This, however, only involved those taken at considerable distances or in a way that might raise an issue.

There was a tendency on the part of some merchants to prepare the sample. This was objected to, the inspector insisting upon the delivery of that displayed for sale.

It was thought advisable to inform merchants of the purpose of the purchase. This enabled them to take specimens for themselves, which many did, for the purpose of "comparing tests." Whether they had such tests made or not we were unable to learn, except in a very few instances. It appeared, however, that all were satisfied with our findings, as no protests appeared. Each merchant was notified as to findings as soon as the specimens from his place had been examined.

LABORATORY TECHNIC

The procedure for evaluating the number of bacteria was as follows:

1. The ground meat specimen received at the laboratory was in the same wrappings as used in delivery to the public.
2. The entire sample was weighed. Ten grains were transferred to a 90 c.c. sterile water blank with a sterile spatula. Care was used to get as complete a cross-section of the sample as possible.
3. The blank was then shaken vigorously for 30 seconds. Two dilutions were made from the original 1 to 10 dilutions, 1 to 1,000, and 1 to 100,000. From the latter, plates were poured, with additional plates with 0.1 c.c. of the 100,000 dilution, giving check plates of 1 to 100,000 dilution.
4. The plates were incubated for 48 hours at 37° C.

The media used were plain nutrient agar. An index of the laboratory results is shown in Table I.

TABLE I

RESULTS OF BACTERIOLOGICAL EXAMINATION OF SPECIMENS OF HAMBURGER, OR GROUND MEAT COLLECTED FROM MEAT MARKETS

Sample No.	*Bacteria per Gm.*	*Sample No.*	*Bacteria per Gm.*
1	300,000	21	100,000
2	200,000	22	3,800,000
3	9,800,000	23	10,000,000
4	5,400,000	24	100,000
5	600,000	25	3,500,000
6	600,000	26	700,000
7	1,000,000	27	1,200,000
8	600,000	28	3,600,000
9	700,000	29	5,000,000
10	1,200,000	30	4,100,000
11	1,500,000	31	300,000
12	9,500,000	32	20,000,000
13	3,200,000	33	3,800,000
14	1,700,000	34	5,000,000
15	4,500,000	35	500,000
16	7,200,000	36	100,000
17	400,000	37	400,000
18	6,200,000	38	4,500,000
19	2,100,000	39	800,000
20	900,000	40	700,000
		41	4,800,000

As soon as possible after the bacterial count was certified the meat market was notified. Where the count was above 10,000,000 per gm. a communication accompanied the count explaining our position relative to the high count. The result was without exception a very noticeable improvement. Bacterial counts were less in number and the ground meat was much improved in quality.

A few of these results are shown in Table II. This is, however, only part of the picture. Subsequent counts showed a continued improvement. For instance, in the case of establishment No. 5, the count decreased on successive specimens, taken several days apart as follows: 1st, 21,000,000; 2nd, 6,000,000; 3rd, 1,700; and 4th, 700. This was similarly repeated in No. 12: 1st, 18,000,000; 2nd, 8,000,000; and 3rd, 100,000; and again in No. 21: 1st, 26,000,000; 2nd, 1,800,000; and 3rd, 300,000.

TABLE II

SHOWING DECREASE IN BACTERIAL COUNT FOLLOWING NOTIFICATION OF EXCESSIVE COUNT

Establishment No.	*Bacteria per Gm. Original Specimen*	*Bacteria per Gm. Following Notice*
4	32,000,000	1,600,000
5	21,000,000	6,000,000
7	13,000,000	2,800,000
9	19,000,000	500,000
10	10,000,000	2,800,000
12	18,000,000	8,000,000
14	17,000,000	4,000,000
15	15,000,000	900,000
16	16,000,000	1,100,000
19	19,000,000	600,000
20	19,000,000	300,000
21	26,000,000	1,800,000

AN ORDINANCE NOW IN FORCE

Such showings as these made it possible for us to go before the City Council and ask for an ordinance fixing a bacteria count for determining the wholesomeness of hamburger, or ground fresh meat.

This ordinance reads as follows:

Unlawful Bacterial Content of Ground Meat—It shall be unlawful for any meat market to hold, sell, or offer for sale any hamburger or fresh unseasoned ground meat the average bacterial count of which exceeds 10,000,000 per gram. The average bacterial count shall be deemed to mean the logarithmic average of the bacterial counts of all samples taken during a period of not less than 4 days, and including at least four samples taken on separate days.

It is gratifying to say that we have not found it necessary to prosecute a single case for violation of this standard for the reason that we have never been able to get 4 successive high counts in the 2 years and 6 months the ordinance has been in effect. Notices of high counts are always followed by improvements in line with that shown.

Mosquitoes In Aircraft

A GOOD deal has been said and written upon the carriage of insects, and particularly mosquitoes, in aircraft.

In connection with yellow fever, the general opinion appears to be that there is very little risk of the carriage of infected mosquitoes by this method. At the International Health Conference, held at Cape Town in November, 1932, ". . . it was agreed that the risk of transporting mosquitoes in an infective condition is comparatively small, and can be met by the simple measure of de-insectisation of aeroplanes. Aedes may travel by trains or motors with equal facility. . . ."[1]

The majority of authorities on the subject have referred to this simple measure of de-insectisation. The method is simple, but its application in the ridding of an aeroplane of all insects definitely is not.

That "Aedes may travel by train or motors with equal facility" may be true; but would they travel as far in, say, four hours as they would do by aeroplane? In Africa, neither trains nor motors normally travel 300 or 400 miles without a stop, nor do they usually travel with doors and windows closed. In trains and motors mosquitoes have almost uninterrupted opportunities for escaping. It is not so in aeroplanes, from which escape is only possible at stopping places hundreds of miles from the starting-point.—*Quart. Bull. Health Organisation of the League of Nations*, V, 1:81 (Mar.), 1936.

REFERENCE

1. *Quart. Bull. Health Organisation*, 1933, 2, p. 19.

Diagnostic and Immunological Tests of Rabies in Mice*

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THIS report deals with a method for diagnosing rabies by inoculating suspected material into mice and with tests for evaluating antirabic vaccines in mice.

Recently interest in rabies has become widespread. Public health authorities note an apparent increase in prevalence of the disease in animal species and recognize its consequent threat to man. Methods to control its spread in dogs have not, in most localities, met with conspicuous success. The effectiveness of canine preventive vaccination as now practised is questioned, and doubt is cast as to which of many methods of treating humans following exposure is preferable. Moreover, laboratory workers with new knowledge of viruses seek further data on rabies as the outstanding example of a virus disease in which immunization can supposedly be secured by a non-living vaccine, and in which the virus agent spreads in the body presumably along the nerves. A renewed study of rabies is timely, therefore, both from theoretical and practical viewpoints.

A review of experimental work on rabies brings out at once a fundamental and well recognized difficulty, namely, the lack of a test animal and a technic insuring quantitative results. If animals are inoculated with rabies virus in a manner approximating nature, their individual responses in general are irregular and difficult to measure, while if they are inoculated with large doses directly into the brain in order to eliminate these variations, all are usually overwhelmed. For example, when batches of animals are injected with material for diagnosis, irregularities of incubation period are encountered. When vaccinated and non-vaccinated animals are compared for resistance, any differences which may be present are masked if the test injection is made directly into the brain, and are difficult to measure if the injection is made peripherally. Due to inadequate methods of investigation, many problems in rabies remain unsolved.

The technical difficulties have now been overcome in part by finding that special strains of mice bred for susceptibility to virus infections are 10 to 100 times more susceptible to rabies than other laboratory animals per gram of body weight. One one-hundred-millionth gm. of mouse brain virus is fatal to at least 50 per cent of these mice when injected intracerebrally; larger quantities are practically always fatal. Injected into the tongue, cheek, thigh, or subcutaneous tissue, 1/10,000 gm. or more is similarly fatal. The peri-

* Read before the Epidemiology Section of the American Public Health Association at the Sixty-fifth Annual Meeting in New Orleans, La., October 20, 1936.

toneal route, however, is somewhat less effective. These mice, therefore, become the animals of choice in the experiments now to be described.

A diagnostic test by mouse inoculation was developed [1] as a possible aid to the Negri body method. Sterile bits of Ammon's horn of the suspected case of rabies are emulsified in distilled water to make a 5 to 10 per cent suspension; 0.03 c.c. of this is then injected intracerebrally, and 0.25 c.c. intramuscularly into each of 6 Swiss mice. One animal is sacrificed on the 5th, 6th, and 7th days respectively and their brains examined for Negri bodies. The remaining 3 are observed for 4 weeks for signs of rabies. When prostrate, they are sacrificed and searched for Negri bodies.

Forty dog brains received by a city department of health have been tested. In 32, no Negri bodies were found and the inoculated mice remained well. In the remaining 8, a positive diagnosis was confirmed within 10 days by animal inoculation.[1] Brains of 28 supposedly normal wild animals have likewise been tested. Three of 9 skunks were positive by the mouse inoculation test. This brief experience suggests that this diagnostic tool may aid in the more accurate determination of the foci of rabies, together with its amount and spread in a given community.

The immunizing value of commercial antirabic vaccines has been studied by using a mouse serum-protection test and a mouse resistance test. The serum protection test was employed to measure the amount of neutralizing antibodies produced in humans following routine vaccination. It was also used to measure neutralizing antibodies in mice following experimental vaccination. Undiluted serum is mixed with equal amounts of mouse passage virus in various dilutions, the mixtures are heated at 37° C., and each is injected intracerebrally into 4 mice. The titer of virus plus normal serum is read as that dilution giving 50 per cent or more mortality in the injected mice. This titer, 10^{-5} or 10^{-6}, is compared with that of virus plus unknown sera.

In one series of tests, sera of persons treated with vaccines containing live virus were found to neutralize 100 to 1,000 lethal doses of virus over periods as long as 4 years. In another series, 23 nurses, physicians, and laboratory workers, receiving the full course of 14 doses of Semple vaccine, "G", have thus far been tested over a 15 month period (Figure I). Their sera, by the last day of treatment, showed antibodies neutralizing for the most part 1 to 10 lethal doses of virus. At 2 months, all those tested neutralized 10 to 100 or more doses, and from that time through 15 months all neutralized a full 100 lethal doses of virus. Finally, a group of 17 persons, receiving Semple vaccine, "N", from another laboratory, failed to neutralize the virus to any significant degree over an 8 month period (Figure I). Apparently, therefore, not all preparations of Semple vaccine are equally potent in stimulating neutralizing antibodies in humans.

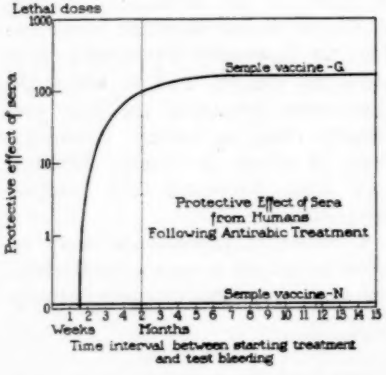

FIGURE I—Protective effect of sera from humans following antirabic treatment

Attention was next turned from humans to mice to determine whether commercial vaccines could produce not only neutralizing antibodies but actual resistance. Since some of these vaccines contained live virus, tests were also made of the effectiveness of virulent mouse passage laboratory virus. Live virus given subcutaneously in a single dose supposed to contain 1/10 the average minimum infecting dose produced rabies in an occasional mouse and in the remainder stimulated but little neutralizing antibody production and little resistance to a subsequent intracerebral test infection. A smaller vaccinating dose still brought down an occasional mouse with rabies and failed to immunize. Live virus given intraperitoneally, on the other hand, proved less infectious, and a single dose containing 1/10 to 1/100 of the average minimum infecting dose, although it produced rabies in the frequency of about 1 animal in 100, stimulated neutralizing bodies within 10 days in the remaining 99 per cent and rendered them actually resistant to 1,000 intracerebral lethal doses. This resistance has lasted 6 months and is active against all strains employed. Vaccination of mice with mouse passage, live virus, therefore, is dangerous and unsatisfactory if given subcutaneously; if given intraperitoneally in a single dose, it remains slightly dangerous but very effective.

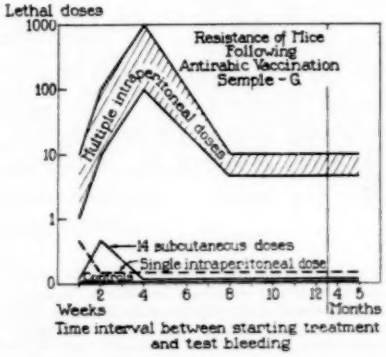

FIGURE II—Resistance of mice following antirabic vaccination, Semple " G "

Commercial vaccines said to contain live virus, when injected intracerebrally, brought mice down promptly with rabies, but when injected peripherally were relatively harmless. Given to mice as a vaccine according to directions, by the subcutaneous route, they did not immunize; by the intraperitoneal route, however, they produced both neutralizing antibodies and resistance in high titer. In this respect they resembled the single dose of virulent laboratory virus.

The standard Semple vaccines have been studied with special care. In the first place, Semple vaccine from laboratory " G " which in humans produced high titer neutralizing antibodies, when tested for the presence of live virus, invariably gave negative results. Repeated injections of many specimens directly into the brain, filtering or sedimentation of large particles of tissue in the vaccine, emulsifying them and injecting them intracerebrally and intraperitoneally in large doses have failed to produce rabies. If live virus was present at all in the " G " vaccines, it was there in minute, subinfective amounts. Secondly, Semple vaccine " G ", when properly employed, rendered the mice highly resistant to an inoculation of rabies virus directly into the brain (Figure II). But to achieve this resistance, vaccination was required not by the standard subcutaneous route but by way of the peritoneal cavity. Batches of 50 to 75 mice were vaccinated by different routes and with different numbers of doses, and tests made subsequently of their resistance to intracerebral injection of virus and their serum-neutralizing properties. The intraperitoneally vaccinated mice de-

veloped resistance within 7 days to 10 to 100 intracerebral doses of virus and also showed strong serum-neutralizing antibodies. Both antibody and resistance titers have continued at high levels during the 5 month period tested. Six intraperitoneal doses, 1 every other day, proved nearly as effective as 14 doses, 1 per day; 3, with 1 every other day, seemed ample for prophylaxis. A single intraperitoneal injection of vaccine did not render the mice resistant to the intracerebral test dose. The required amount of vaccine per dose proved considerably in excess of that employed for man per gm. of body weight. Finally, the effectiveness of "G" vaccine was found to deteriorate rapidly within 4 months after preparation.

Neutralizing antibodies were not invariably a direct index of the presence of resistance (Figure III). While vaccination of mice by the subcutaneous route failed to produce either antibodies or resistance, and *multiple dose* vaccination by the peritoneal route produced both, a *single dose* peritoneal vaccination produced antibodies but no resistance as tested. This question is being studied further.

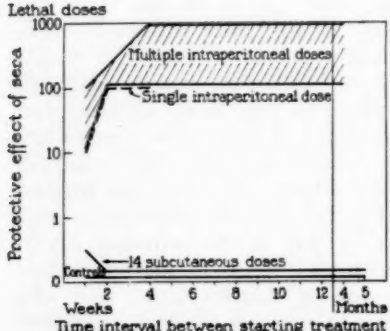

FIGURE III—Neutralizing antibodies in mice following antirabic vaccination, Semple "G"

From these experiments a test for evaluating the efficacy of antirabic vaccines in mice is being developed. The material is injected first directly into the brain and muscles of mice to detect live virus. Second, mice are vaccinated intraperitoneally with 6 doses, 1 every other day, each dose comprising ⅛ the stated volume diluted 10 times. These vaccinated mice are tested subsequently for their intracerebral resistance on the 10th and 21st days. The test, as now run, will doubtless be improved, but already it has classified the preparations into (A) those containing demonstrable live virus and protecting mice; (B) those containing no demonstrable live virus and protecting mice; and (C) those containing no demonstrable live virus and not protecting mice.

In conclusion, the diagnostic test, neutralizing antibody test, and resistance test provide methods for the quantitative study of rabies. Results thus far suggest, from the theoretical viewpoint, that neutralizing antibodies are not always a direct measure of resistance, and that vaccines containing no demonstrable living virus may produce resistance. Moreover, they show that the optimum method of securing prompt and effective immunity to rabies in the mouse is by the intraperitoneal injection of relatively large amounts of vaccine, 6 doses, 1 every other day. The work suggests from a practical viewpoint that rabies vaccines should be employed which have a high rating according to the mouse test.

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Bacteriological Examination of Glassware or China for Sanitary Quality*

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THE time has come when something must be done about the insanitary conditions prevailing in connection with the dispensing of beverages. Both the public and the public health officer agree on this. Although the problem has been met in some places by the use of single service paper cups, it is common knowledge that glasses are only superficially washed or disinfected between patrons. Our personal observations are that in many places dispensing beer, the glasses are not washed at all. This is probably true to a lesser extent in other beverage dispensing establishments. Sporadic efforts have been made to remedy this situation in some cities. At best, such efforts have been considered only partially successful even by their sponsors. As Calver [1] has pointed out, there is a real opportunity to better control of respiratory diseases by means of improved sanitation of glasses and other eating utensils.

However, before we can expect the health officer or his inspectors to improve conditions very much, he must be provided with certain information. First, he must have a reasonably reliable method whereby he can determine whether glasses and dishes have been improperly handled; second, he must be able to offer definite constructive suggestions as to effective washing equipment and methods. We believe that the lack of positive information on these points has delayed the carrying out of a much needed program of education and compulsion in regard to the unclean utensil situation.

METHODS IN USE

A good list of technics for the bacteriological examination of glasses has been compiled by Calver.[2] These include various modifications of the swab method, rinsing, direct plating of utensils, direct microscopic examination after staining, and several others. The agar disc method, used by Olson and Hammer [3] to study churn contamination, was considered by us to merit some study as to its possible use in public health work. The agar medium is allowed to solidify. The agar disc is then picked up with a sterile spatula,

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* Read at a Joint Session of the Laboratory, Food and Nutrition, and Public Health Engineering Sections of the American Public Health Association at the Sixty-fifth Annual Meeting in New Orleans, La., October 23, 1936.

Contribution No. 258, Massachusetts Agricultural Experiment Station.

placed in a sterile Petri dish and allowed to incubate. The colonies developing on a measured area are counted and the results expressed as number per sq. cm.

COMPARISON OF VARIOUS BACTERIOLOGICAL TECHNICS

In all, 18 different methods of sampling glasses and dishes were compared for utility, accuracy, speed, and simplicity.

A method to be of use to the busy health officer or his laboratory must be relatively simple. We realize that no method will give much information as to pathogens. Of the many organisms transmitted by the mouth secretions, only the diphtheria bacillus and the pathogenic cocci can be recovered with any degree of success. We must then turn to total counts to guide us in making a decision as to the sanitary quality of glassware and its likelihood of transmitting disease.

The agar disc method was too difficult to use, resulted in too many failures, and could be applied only to small areas of the glass. However, the recovery of bacteria artificially inoculated on glasses was approximately 50 per cent. The microörganisms used were *Serratia marcescens* and *Escherichia coli.*

The making of rim impressions of glasses and other containers on agar plates was tried many times. Both firm and soft agars were used. This method possesses the disadvantage of contacting only limited portions of the container. It is subject to contaminations, is not readily carried out in restaurants or drinking places, and results cannot be easily duplicated. Furthermore, colonies tend to be confluent, and counting is difficult.

Direct plating of pieces from broken glasses and cutouts from paper cups were investigated. This method is decidedly unsatisfactory from many points of view. Direct microscopic examination of broken glass rims, stained with various stains in an effort to make the bacteria visible, was almost a total failure. In the case of paper cups, the method failed to give good duplicate results and bacteria often failed to grow from the surfaces of the waxed paper, even though they had been artificially inoculated.

The many variations of the swab method will not be enumerated here. We tried swabs of different sizes with applicators of different lengths in test tubes containing broth, saline or distilled water. Different methods of swabbing, and a number of media were also tried out. In general, all swab methods were very practical, rapid, and simple. The recovery of bacteria was always over 40 per cent and often 75 per cent with *Serratia marcescens, Escherichia coli,* and *Streptococcus hemolyticus.* In mixed cultures used as inoculating suspensions, the percentage recovery was always less than when pure cultures were used. The many data obtained were used in the formulation of the standard method here proposed. They are too numerous for reproduction in this short paper. While the method in itself is not new and various parts have been previously described, we feel that a definite procedure if adopted by health laboratories for glassware examination will yield comparable results and will serve to give an excellent idea as to the sanitary condition of glassware.

PROPOSED STANDARD METHOD

SAMPLING

The method consists in preparing medium sized cotton swabs on wooden applicators immersed in approximately 3 c.c. of saline (0.8 per cent NaCl) in ordinary 25 c.c. culture tubes. The tubes are cotton stoppered with the

applicator sticks protruding slightly above the plugs. Sterilization is accomplished by autoclaving at 10 lb. steam pressure for 20 minutes. To avoid evaporation, storage should be at low temperatures.

Boxes or packets of these tubes are taken by the inspector who secures his samples as follows:

Remove the plug; lift the applicator above the surface of the liquid; press against the side of the tube and twist so as to squeeze out as much excess saline from the swab as possible. Remove the applicator and thoroughly swab the inside and outside lips and rims of glasses. Replace the applicator in the culture tube and insert the cotton plug. A number of glasses should be swabbed in each establishment in order to obtain a fair average. Tubes should be labeled and returned to the laboratory for plating within a few hours, preferably 2 hours.

PLATING OF THE SAMPLES

Upon arrival at the laboratory the tubes are agitated by holding firmly in the hand and striking 25 times. Remove the plug, squeeze the cotton swab as before to remove excess liquid, and discard. The liquid contents of the tube are poured into a Petri dish. There is actually only a very small amount of liquid retained by the swab. At this point, the swab may be used to inoculate Loeffler's blood serum slants in an effort to isolate pathogens.

Next 7 c.c. of nutrient agar (2 per cent agar) is poured in the Petri dish and mixed thoroughly. Incubation is at 37° C. for 48 hours. Counts are recorded for individual glasses and not as averages.

With slight modifications the above

TABLE I

TEST OF PROPOSED METHOD USED IN SOME EATING PLACES

Establishment	*Bacteria per Glass Individual Counts*	*Average*	*Method of*		
			Cleaning	*Rinsing*	*Drying*
Soda Fountain 1	3, 0, 2, 1, 9, 8, 1, 3	3	soap and hot water	hot water	metal racks
" " 2	3,900; 3,700; 670; 3; 20,700; 280	4,880	soap and tepid water	sozzle	shelf under counter
" " 3	2; 3; 580; 5; 120; 13.300; 9,300	4,720	dirty dish water	sozzle	metal racks
Restaurant 1	5,600; 360; 460; 3,300; 3,300; 2,100	2,520	dirty dish water	tepid water	dirty towel
" 2	150; 10; 45; 20; 23; 25	48	soap and hot water	hot water	clean towel and tray
" 3	134; 11; 400; 500	260	soap and hot water	hot water	dish towel
" 4	50; 15; 10; 8; 16	20	soap and hot water	hot water	dish towel
" 5	10; 12; 45; 9; 3; 4	14	steam washing machine	unnecessary	dish towel
Bar 1	2,800; 11,000; 50; 40; 160; 1,900; 20	2,280	warm water no soap	warm water	none
" 2	too numerous to count approximately 350,000	350,000	merely rinsed	cold water	none

method is easily adapted to the examination of dishes and silverware.

While occasional plates may be overgrown or colonies too numerous to count, the writers feel that plating the whole sample is better than making routine dilutions. At least, the results give an excellent idea as to the sanitary quality of the glassware examined. The method is also useful in the study of bacteriological effectiveness of mechanical dish washers and cleaning and sterilizing compounds.

Table I summarizes the results of a practical test of the proposed method used in some public eating and drinking establishments. A good correlation is shown between the care in cleansing and the number of viable organisms left on the glassware. These results should not necessarily be viewed with alarm, but they can be taken as good indications of the general sanitary conditions of the individual establishments. High counts should warrant more critical routine inspection by the health departments.

SUMMARY

A comparison of various methods for the bacteriological determination of sanitary quality of drinking glasses and eating utensils showed the swab method to be most satisfactory. From 40 to 80 per cent of the organisms present are recovered by this technic.

Specific directions are given for preparing sampling tubes, taking and handling samples, and recording results. These can be carried out at small expense in any health laboratory.

Practical tests of the method show it to be rapid, simple, and reliable. Health laboratories can use the method in a routine way to check cleansing and sterilization of utensils in food and beverage dispensing establishments.

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Novel Purification Design

. . . The principal novel features of Burnt Mills, Md., water purification works pertain to the treatment unit assembly, containing a pipe vault, 4 filters, each of 1¼ m.g.d. nominal rating, a filter control house, a coagulating basin having a 55 minute detention period, and a 275,000 gal. filtered water reservoir. These are built of steel, cylindrical in form, and arranged concentrically. The flat continuous bottom of the structure rests on a thin concrete base lightly reinforced and the outside frame of the reservoir is surrounded by a loose rock collar to a height of 4', beyond which there is earth fill. All seams are welded with the exception of the roof of the filtered water reservoir which has a thickness of 3/16", all plating is 5/16" thick. No deterioration of the steel work in the plant has been found at the end of approximately 1 year's operation. At the present time a second filter plant of 5 m.g.d. capacity, is under construction.—*Annual Report of the Bureau of Sanitary Engineering of the Maryland State Board of Health—Year 1935.*

International Standardization of Biological Products by the League of Nations*

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WHEN we begin to think in terms of standardization from the international point of view, it is natural that we should consider what has been accomplished in fields other than those that are of special interest to us. Certainly not much standardization of language exists; there are at least two systems of weights and measures in common use; and we begin to think that perhaps time alone is universally standardized in the civilized world until we recall that the 24 hour day is in common use in much of Europe, and that we in some parts of the United States have been introducing a little elasticity by having daylight saving time during the summer months.

The question naturally arises as to how the United States came to participate in the League of Nations Conferences on Standardization while not a member of the League. The answer is that our State Department was equal to the task of deciding promptly when the matter was presented to it, and it was prescribed that the American representative should serve in a consultative, not in an advisory capacity. There really is a difference, if you think long enough about it. In practice it works out that he functions in the same manner as other members of the commission but does not vote.

The Standards Commission is a creature of the Health Organization of the League of Nations and accordingly its actions are subject to the approval or disapproval of that body.

There are two international organizations functioning in the field we are considering—the Permanent Standards Commission of the League, which has had about half a dozen meetings and has adopted the standards mentioned below, and the Inter-Governmental Conference on Biological Standardization to which were invited representatives of practically all of the countries of the world. This body has had but one meeting and, in general, adopted, without appreciable modification, the standards established by the Permanent Standards Commission.

The commission naturally takes into account any work that has been done

* Read before the Laboratory Section of the American Public Health Association at the Sixty-fifth Annual Meeting in New Orleans, La., October 21, 1936.

prior to its own consideration of any subject. Thus, for example, Professor Weinberg, of the Pasteur Institute, who has long been interested in the gas gangrene group of organisms and has done much work with these anaerobes was in a position to furnish a serum on which a standard for Vibrion septique antitoxin could be based. This serum was reduced to a condition to assure permanence, and a test dose was then determined. A previously ascertained unit of test toxin and an antitoxin of unknown potency were distributed for comparative testing in Copenhagen, Paris, Washington, and a number of other centers, 7 in all. The results at the 7 testing institutions were so close that it was decided to adopt the unit for international use.

In general, the commission defines standards and prescribes units, usually in terms of fractions of a milligram of the dry standard, but it does not undertake to lay down methods of testing, this being left to the individual choice of the various national laboratories. Standard preparations are distributed from the State Serum Center at Copenhagen for members of the serum-bacterial group, and from the National Institute of Medical Research, London, for hormones, vitamins, and other preparations in which the question of immunity does not arise.

It has been the policy of the commission to standardize preparations used prophylactically or therapeutically without reference to the degree of usefulness, the only policy that, in my judgment, could be readily justified.

The commission has refrained from taking action with respect to preparations where the standardization seems hopeless, for example, in the case of antimeningococcus serum. This preparation is often the subject of discussion by the commission and it always ends in the same way, namely, that we are still without sufficient information for effective standardization.

In addition to preparations of the group in which considerations of immunity arise and in which we are especially interested, the committee has undertaken through experts the standardization of certain drugs, for example, digitalis; certain hormones, for example, insulin; and nearly all of the group of vitamins.

Standards originating in America have fared very well with the international commission. It has adopted our units for antipneumococcus serum and for perfringens antitoxin. The latter is the most important member of the gas gangrene group.

The first unit to be adopted by the commission was that for diphtheria antitoxin. Here there was no difficulty in agreeing on the Ehrlich unit as it was used universally throughout the world although distributed from two centers, Frankfort am Main and Washington, D. C.

The international standard unit for tetanus antitoxin probably has provoked more discussion and has been the subject of more difference of opinion among members of the commission than any other five products, and that is putting it mildly. The competition for favor lay between the old German unit and the American unit, the former having the merit of priority, the latter of convenience in "size." Both were extensively used, probably about equally if we consider the whole world. The German unit was about 66 times the size of the American unit and it was generally recognized that this was inconveniently large. Therefore the German authorities adopted a new unit, approximately half the strength of the American unit. This new German unit was later adopted by the League Commission over the protest of the American representative. The attitude of

the American control authorities was, and has been, that they would be willing to consider any new unit that offered advantages over their own. As the situation stands, the two units are widely used and, indeed, some official control authorities require the label to show the number of units according to the two standards. The American control authorities require the use of the American standard and permit the use of the international unit. The matter is not without practical significance since 1,500 units of the international potency, the usual prophylactic dose of tetanus antitoxin, contains approximately the equivalent of 750 units according to the American standard. I say approximately because it has been shown that the new unit is not precisely one-half the American, but the difference is not of great importance.

Standards for scarlet fever preparations have not been adopted by the commission chiefly because of the control over these preparations by the organization holding the patents covering them. Personally, the writer doubts the wisdom of this policy of nonrecognition since the United States control authorities have found it practicable to standardize and control scarlet fever toxin and antitoxin in a manner which appears to be satisfactory to all concerned.

Antipneumococcus serum is the only antibacterial serum that is in contrast with antitoxic serum, that has been standardized.

I think all of you will appreciate the reluctance of control authorities to adopt units for antibacterial preparations. We are so accustomed to thinking in terms of toxin in serum neutralization tests that it goes against the grain to contemplate a standard unit based on a living culture.

Thanks to the work of Dr. Lloyd D. Felton, to whom the modern production and application of antipneumococcus serum is so largely due, and to the perseverance in attempts at standardization by certain commercial manufacturers of antipneumococcus serum, the difficulties were to a large degree overcome. After carrying on tests in various laboratories, the commission adopted the standards for types I and II. Dr. Felton's F-146 was taken as a basis for the standardization, and units were defined in the usual manner.

Aside from the tetanus unit, there has been but one immunological preparation on which the American delegate could not see eye to eye with his European colleagues. This was diphtheria toxin for the Schick test. The committee adopted a standard which took into account the neutralizing power of the toxin as well as the toxicity, whereas the American requirements cover only the test for toxicity which we have found quite satisfactory.

While the members of the arsphenamine group of preparations do not fall into the serum-bacterial group they should, on account of their interest to public health authorities, be mentioned here chiefly because the United States authorities employ methods of control different from those adopted by the League of Nations Commission. The first point of essential difference lies in the fact that the United States control authorities have not adopted a standard control preparation with which new commercial batches may be compared in toxicity tests. It was felt by the American authorities that assays were quite satisfactory when based simply on establishment of the toxicity of the preparation without the use of an official control standard, a method which has given satisfactory results over a period of many years.

The second essential point of difference lies in our unwillingness to adopt an animal test for therapeutic

Standard	*When Adopted*	*Int. Unit in Milligrams*
Diphtheria antitoxin	1922	0.0628
Tetanus "	1928	0.1547
Antidysentery serum (Shiga)	1928	0.0500
Gas-gangrene antitoxin:		
B. perfringens	1931	0.2660
Vibrion septique	1934	0.2377
B. oedematiens	1934	0.2681
B. histolyticus	1935	0.3575
Antipneumo serum, Type I	1934	0.0886
" " " II	1934	0.0894
Staphylococcus antitoxin	1934	0.5000
Diph. antitoxin for the flocculation test	1935	
Old tuberculin	1931	

activity. Our disinclination here springs from the conviction that the trypanocidal activity test does not furnish useful information in terms of curative action as applied to clinical conditions. A spirocheticidal activity test, which is the alternative permitted by the commission, seems impracticable of application on account of the length of time required to carry it out and the inherent uncertainties and difficulties of the test. Perhaps the satisfaction of control authorities in the United States with respect to our methods in this field arises from the fact that in the nearly 20 years of their use, there has not come to light any evidence of excess toxicity of any preparation that could have been detected by any other method of testing in use anywhere. Furthermore, there is no evidence of want of therapeutic efficacy of any product in the American market, whether produced here or abroad.

The above tabulation taken from the report of the Inter-Governmental Conference on Biological Standardization at Geneva, 1935, shows the progress that has been accomplished by the commission in the serum-bacterial group. All of these are distributed by the State Serum Institute at Copenhagen.

ACKNOWLEDGMENT

The Permanent Standards Commission has had the unselfish aid of two special experts, to whom acknowledgment is due, Dr. Percival Hartley, of the National Institute for Medical Research, London, and Professor Claus Jensen, of the State Serum Institute, Copenhagen.

We cannot close this brief account of the work of the Permanent Standards Commission without saying that whatever measure of success has attended the work of the commission, and I think it has been large, has been due almost entirely to the ability and to the influence of the gentleman who has been chairman throughout the period of the existence of the commission, Professor Th. Madsen, a man who, had his talents not been devoted to science, would have taken high rank as a diplomat—indeed, his diplomatic talents have been called into use in connection with the work of the Standards Commission about as much as his scientific attainments.

EDITORIAL SECTION

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SAVE THE SURGEON GENERAL'S LIBRARY

"THE outstanding contribution which our country and its government have made to medical knowledge "— In these words of Dr. William H. Welch, the Medical Library Association in a resolution adopted at its 38th annual meeting, aptly characterizes the U. S. Army Medical Library and the *Index-catalogue* which it issues. The Medical Library Association in this resolution given herewith urges the Congress of the United States to appropriate adequate funds for the maintenance and growth of the collection of books and the preparation of the *Index-catalogue,* which Major Edgar E. Hume, present librarian of the Surgeon General's office, calls "The most comprehensive piece of bibliography ever attempted in any field of knowledge."

In 1840 the Army Medical Library was started for the purpose of stimulating interest in medicine among army surgeons. In 1868 Dr. John S. Billings became librarian and, with a vision seldom found, started to build up this monumental collection and the accompanying catalogue. He labored for over 25 years in this field and succeeded in that time in making this library of indispensable service to the medical profession not only of the United States but of the entire world. Dr. Billings's conception of the library was that it should disseminate knowledge of medicine as well as catalogue it and his catalogues and bibliographies have become the means for such dissemination. It is not too much to say that every physician and public health worker in the United States has profited and is profiting by the vast fund of knowledge made available to teachers and research workers as well as to the humblest practising doctor in the country through the bibliographies published from time to time under the heading *Index-catalogue.*

Since Congress has adopted a somewhat niggardly attitude toward the library, it behooves all of those interested in better health for the individual and the community to support the resolution of the Medical Library Association. The conception of the library, created by Dr. Billings and forwarded by Dr. Fielding H. Garrison and Dr. Robert Fletcher, has been carried on by successive

librarians in recent years. Attempts have been made to combine this library with the Library of Congress but, in the opinion of those who know the Surgeon General's Library best, such a combination would be disastrous to best bibliographical work in the field of medicine.

The publication of the *Index-catalogue* is naturally dependent upon the availability of books and periodicals in all languages that present material suitable for listing in the *Catalogue*. The publication of such a work is very expensive. One thousand copies of each volume are printed and cost between $18,000 and $19,000 merely for the printing. The work of preparation increases the cost to more than $30,000 a volume.

Like other libraries, the Army Medical Library has had difficulty in maintaining its shelves and personnel during the depression. Appropriations for books have been cut from $20,000 annually to less than $15,000 and this, coupled with the fact that the purchasing power of the American dollar in European countries has fallen considerably, makes the appropriation even smaller. Funds are needed for books to fill the gaps left vacant during the last 5 years and to buy new publications and periodicals recently issued. Cataloguers and other personnel are expensive, and money for this purpose is needed. The total amount, however, is an insignificant sum compared with the hundreds of millions and billions being appropriated for other army and navy purposes and for a great variety of other projects.

Readers of the *American Journal of Public Health* are urged, therefore, to present the important matter of maintaining the Medical Library of the Surgeon General of the U. S. Army to their senators and congressmen before the next session of Congress. Most of these men have no conception of the real significance and value of this great collection of books and of the *Index-catalogue*. It ought not to be difficult for medical and lay public health workers to make congressmen feel that an adequate appropriation for the Surgeon General's Medical Library is essential to the health and well-being of every citizen in the country. Let us mass public opinion to support this, the greatest medical library in the world.

RESOLUTION RECOMMENDING THE APPROPRIATION OF ADEQUATE FUNDS FOR THE MAINTENANCE AND GROWTH OF THE ARMY MEDICAL LIBRARY'S BOOK COLLECTION AND INDEX-CATALOGUE.

The Medical Library Association, comprising two hundred of the medical libraries of the United States and Canada, assembled in its thirty-eighth annual session in St. Paul, June 22, 1936, notes with pleasure and pride the appearance of volume one of the Fourth Series of the *Index-catalogue* of the Library of the Surgeon-General's Office, United States Army (Army Medical Library). The Association records with satisfaction the abbreviations and changes in composition in this new volume effecting a saving of twenty per cent in space with accompanying reduction in cost.

After a delay of three years during which no volumes of this *Catalogue* were printed, the appearance of this first volume of the Fourth Series gives renewed assurance of the continuation of this publication, which, together with the Army Medical Library, is considered the outstanding contribution which our country and its Government have made to medical knowledge, and

WHEREAS, The value and usefulness of the *Index-catalogue* is dependent upon the completeness of the files of medical publications contained in the Library of the Surgeon-General's Office—a public, national, medical library, the greatest in the world, serving in its present form of administration with satisfaction the medical profession and the medical libraries of our country, and

WHEREAS, In recent years the annual appropriation of the Congress has been wholly inadequate to provide sufficient funds to acquire the current medical books and periodicals issued throughout the world, so that they might be available for use throughout the country and for inclusion in the *Index-catalogue,* therefore be it

RESOLVED, That the Medical Library Association urges the Congress to appropriate annually to the Library of the Surgeon-General's Office an adequate sum for current medical books and periodicals and for the purchase of back publications lost during those recent years when the amount granted was grossly inadequate, thus depreciating the completeness and usefulness of the Library's collection; and an additional sufficient sum annually, for as many years as may be required, in order to make for the greatest possible completeness of the collection and its *Catalogue;* and be it further

RESOLVED, That a sum be appropriated annually to defray the cost of printing regularly each year not less than one volume of the *Index-catalogue,* and be it further

RESOLVED, That a copy of these resolutions be spread upon the minutes of the annual meeting of this Association and sent to the President of the United States, the presiding officer of both houses of Congress, the Secretary of War, the Surgeon-General of the Army, and to the national, state, and other medical periodicals with a request for publication, and to the members of this Association, urging the organization of which they are a part and all other medical associations and institutions to adopt similar resolutions to be sent to their local members of Congress requesting their support of these measures.

Preprinted from the *Bulletin of the Medical Library Association,* Vol. 25, No. 1, p. 12, September, 1936. Minutes of the Thirty-Eighth Annual Meeting, Session of June 22, 1936.

DR. CHARLES PORTER

PUBLIC HEALTH, Volume 50, No. 1, October, 1936, appears in a new dress and under a new editorship, Dr. Charles Porter, who has served as Honorary Editor since 1925, having retired. The new editor pays a well deserved tribute to him, pointing out that he had a real gift for journalism in the best sense of the word, and succeeded in endowing the pages of *Public Health* with character and dignity. He calls him the last, for the time being, of a line of distinguished editors, including such men as Sir Arthur Newsholme, Sir Shirley Murphy, and R. A. Lyster. Dr. Porter's editorship was interrupted for one year by his election as President of the Society of Medical Officers of Health of England.

It may be said with a high degree of certainty that readers not directly concerned with affairs of the Medical Officers of Health or with health administration in England, always turned first to the section headed *"Ut Ita Dicam"* (Being Comments, apropos and otherwise, on Sundry Matters). Here we had a running comment on practically every matter of interest in public health in England which had taken place during the preceding month. The writing was excellent and touched off with the wit that was characteristic of Dr. Porter. It is no disparagement to the new editor to say that this will be missed.

The arrangement of the Journal has been changed and a new cover adopted. It is interesting and covers affairs in England quite well; but if we may judge from the first issue, it will be devoted more strictly to summarizing the majority of papers read at meetings and to official affairs. It is planned, however, to ask for special articles reviewing new legislation and recent advances in the particular aspects of preventive medicine.

Our readers will remember the excellent letters in our *Journal* which came from Dr. Porter's pen. A year ago he found it necessary to discontinue these and they have been missed. For Dr. Porter we wish every good thing in life and assure him that he will be missed.

SOUTHERN BRANCH OF THE AMERICAN PUBLIC HEALTH ASSOCIATION

THE Fifth Annual Meeting of our Southern Branch, held in Baltimore, Md., November 17–18, was in every way a great success. The attendance was by odds the largest at any meeting so far, with some 360 registrations. The quality of the scientific papers was very high. Speakers were attracted from various parts of the country, in addition to those who hold membership in the Southern Branch.

The arrangement of the program was made in conjunction with the officers of the Southern Medical Association, so that the sessions of the Public Health Section of the Southern Medical Association fitted in with those of our Southern Branch, making as it were one continuous meeting on public health, which could be attended by all interested in such subjects, since there was no duplication in hours and practically none in subjects.

Among the special features may be mentioned the Presidential Address by Dr. I. C. Riggin, State Health Commissioner of Virginia. This was a summary of the situation regarding poliomyelitis from the beginning of the 1935 epidemic up to the present time. It was followed by a description of the epidemic in Alabama in 1936, by Dr. Baker, State Health Officer, after which Dr. Charles Armstrong, of the Public Health Service, gave the results of his studies on the use of picric acid spray as a preventive of the disease and his results in Alabama. This paper will be given in full in our pages in an early issue. We can only say here that it seems to offer the best hope we now have for the prevention of this dreaded disease. It was listened to with marked attention, and further studies will be carried out.

All of the meetings were well attended, the large room assigned being packed at times until there was only standing room. Needless to say, members of the Southern Medical Association attended our sessions in considerable numbers and, as already said, the combination of the two bodies had all the appearance of a continuous meeting on public health, in which both societies took apparently an equal interest. It goes without saying that many members of the Southern Medical Association are members of the American Public Health Association and also of our Southern Branch.

We cannot speak too highly of the arrangement which has been in effect for several years, that is, several smaller societies holding their meetings in conjunction with the Southern Medical Association. In addition to our Southern Branch, other societies concerned in public health also had their meetings. The National Malaria Committee, in which we are all interested, and the American Society of Tropical Medicine had their sessions in Baltimore, both with valuable papers of interest to all health officers and health workers. Indeed there was intellectual food for all, which it will take many months to digest, and all present are looking forward eagerly to the publication of the papers as matters of permanent record.

The weather was all that could be desired, sunshiny and cool. The people of Baltimore were most gracious in their hospitality. The new Fifth Regiment Armory, in which the meetings took place, was spacious and was most admirably arranged, not only for the scientific sessions but for the scientific and commercial exhibits, of which there were a very large number. It is needless to speak of

the social side of this meeting. The fact that it was in Baltimore carries assurance that it was delightful in every way, being in this beautiful old city with many points of historical interest dating back to the beginning of our country. On every side there were streets, monuments, and buildings carrying names familiar to everyone who has read the history of the foundation of our country. To the people of the city of Baltimore, we owe gratitude.

PUERPERAL FEVER

THE House of Lords of England on July 14, 1936, handed down a judgment on an interesting case in which there is a lesson for us in America.[1]

In January, 1933, Mrs. M. arranged for a private ward for her confinement in the Maternity Home of 16 beds maintained by the Lindsey County Council. She went to the Home on July 12 and, there being no private ward available, entered the public ward. On the 13th she was confined. On July 14, four other patients developed puerperal fever, and on July 17, Mrs. M. became acutely ill with the same infection, but finally recovered. On this date, at the instance of the medical superintendent, the home was closed.

In November, 1933, Mrs. M. brought suit against the County Council for breach of contract; for negligence in not closing the ward on the occurrence of a case of puerperal fever on July 4; and for negligence in failing to inform her, her husband, or her medical adviser that there had been such a case. She won, and judgment was entered for her in the sum of £750, with costs. The Court of Appeal, with one dissentient, affirmed the finding on February 8, 1935. On July 14, 1936, the House of Lords dismissed the appeal of the County Council against this decision. The Lord Chancellor accepted that the jury was justified in holding that without taking swabs there was a grave risk that a carrier might be present, and that until that risk had been eliminated, it was dangerous to admit a new patient to the Home. He held also that if new patients were admitted before the presence or absence of a carrier on the staff had been determined, the doctor in attendance should be informed of the facts and allowed to decide whether his patient should enter the Home, or to decide on what precautions should be taken if the patient were admitted.

It seems then that it is a neglect of duty on the part of a maternity home on the occurrence of a case of puerperal fever (1) to admit any patient to the home without first taking swabs from the staff, and (2) to fail to inform the patient, her husband, or her doctor of the occurrence of a previous case in the home.

Comments on the public health aspects of this case in the *British Medical Journal*[2] say it is a common practice to comply with the first requirement, and hold that it is apparently advisable to do so in all cases, just as there are now examinations for the presence of the Klebs-Loeffler bacillus, X-ray pictures of injured limbs, etc., in order to protect the attending practitioner rather than in the strict interest of the patient. The second requirement offers greater difficulties, as there is no indication of the length of time over which the giving of this notice should extend, or as to whether the necessity of making such a declaration is voided by swabbing, excluding any members of the staff, disinfecting the premises, closing the ward or the entire home, etc. It is held that it is not in the

interests of the patient to submit to her a complete history of the infections that have occurred in the home. It is suggested that it might be well to inform the attending physician and let him make the decision, but that this might lead to his appearance as a defendant.

The history of the case is most interesting and instructive. Certainly some things in England are better managed than in America, though the time taken for the decision by the House of Lords reminds us of the delays in our American courts.

REFERENCES

1. *Brit. M. J.*, July 25, 1936, p. 200.
2. *Brit. M. J.*, Supplement, Aug. 1, 1936, p. 100.

PRESENTATION OF WALTER REED MEDALS

THE meeting of the American Society of Tropical Medicine, held in Baltimore, Md., November 18–20, was made notable by the presentation of two medals. After telling the story of the conquest of yellow fever, which was brought about so largely by the work of Major Walter Reed of the United States Army, a gold medal was presented by proxy to his widow. It was received by Major General Walter L. Reed, Inspector General of the Army, the son of the man in whose honor this series of medals has been named.

We need hardly remind the readers of this *Journal* that Major Walter Reed died before our government had given any proper recognition to the work of which he was the head, either to himself, the members of his committee, or to the volunteers who risked their lives for the benefit of humanity.

The other Walter Reed Medal was presented to the Rockefeller Foundation in recognition of the work which has been carried on by them in practically every part of the world for the eradication of yellow fever, which is now so well advanced.

PUBLIC HEALTH EDUCATION*

Fifteenth Anniversary Overlooked—Quite without remembrance by even those most concerned, the 15th anniversary of the Public Health Education Section came due in October.

In the spring of 1921 a letter was addressed to A. W. Hedrich, then executive of the A.P.H.A. with headquarters in Boston. The letter suggested that health education be given space on the program of the Annual Meeting to be held in New York the following October.

Mr. Hedrich replied to this effect. "Why not? Go to it." And so two sessions were planned, and the attendance was so large and representative that a provisional section was organized with Dr. Lee K. Frankel as the chairman. After a year or two the Section was made permanent, and here we are, having passed the 15th anniversary of those first meetings in a ballroom of the Hotel Astor in New York City.

Possibly next year some of the committees authorized at New Orleans may assess the past, and attempt a glimpse into the future.

We Are Discussed—At New Orleans the "Use of the Department in the *Journal* Devoted to Health Education" was the subject for a luncheon session.

A report was presented on the extent and nature of the material in this department of the *Journal*, in earlier years called "Education and Publicity," and now known as "Public Health Education."

Mr. Routzahn raised questions as to the content of the department, and it was agreed that the Section should have a committee to study the matter, and to give some coöperation.

In One Hundred and Fifty-six Issues—This department started in the issue for July, 1923. Including Oct., 1936, it has appeared in 156 issues, with none in two issues of 1924, and in one each of 1929 and 1935. Dr. H. E. Kleinschmidt edited one issue. The size range runs from 1½ pages to 10 pages in an issue, with an average of 8 pages in the 1935 and 1936 issues, and a total of 779 pages.

What We Try to Talk About—In this department we try to offer practical help to workers in varying types of health agencies. We try to suggest and illustrate new materials, new methods, new audiences. A wholesome questioning is encouraged as to what we have always done and the ways of doing things. We try to have many people represented in what is mentioned and what is quoted. What someone has said or done is usually the text for any comment or suggestion. This includes the repetition of commonplaces and abc's. But there are always new crops of readers coming along.

To the thousands of health agencies represented by readers of this department we have tried to offer a fairly complete list of new helps, new materials for health education and publicity. But we are limited to the information which reaches us.

And many good ideas and useful

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

materials are hidden under the bushel of the state or city of their origin.

Our Little Crusades—We have talked about indexes and tables of contents, and awarded honorable mention when included in annual reports. We have urged that editors be told when we like what they publish about health, and that radio stations learn what we think of their handling of health topics. We have tried to explain what "discussion" really is in a convention program, and how to bring it about. We have asked for criticism of what has been published. We have pleaded for comebacks from our readers.

What of the Future?—None of the questions raised at the New Orleans luncheon were answered. What don't you like? or what do you believe is least useful? *If* you *could* get what you wanted, what would you like in this department? If they could get what they wanted or what they needed, what would that be? How can the editor secure what national agencies now fail to supply? How can he secure what is received from state and local sources?

How can we organize group editorship to take over the coöperative educational opportunity offered by this department?

Health Education at New Orleans—That none may overlook the part of health education in the New Orleans meeting of the American Public Health Association, the record is briefly reviewed.

In a special session, "Advances in Public Health," Dr. William P. Shepard presented "Recent Progress in Health Education Methods."

Health Officers Section had "The Need for and Value of an Intensive Program of Health Education in State Health Departments," by Dr. Felix J. Underwood.

American Association of School Physicians devoted part of a session to "Health Education," by Fannie B. Shaw.

The Public Health Education Section had three luncheons, one dinner, two half-day sessions, and one joint session with Child Hygiene Section.

The technical exhibits contained a measure of health education value; there were extensive scientific exhibits, and Health Education and Publicity Headquarters.

Motion pictures and lantern slides were shown as features of several programs of the convention, and pictures were scheduled at the close of Public Health Education Section meetings.

A broadcast of the American Medical Association was received in Exposition Hall, and numerous broadcasts were given over local stations during the week.

Exhibits, Scientific or Otherwise—The Scientific Exhibits have become an important feature of the Annual Meeting . . . even though not all of them are scientific . . . and some are not exhibits . . . for unhappily the term "exhibit" calls for a reasonable measure of graphic presentation . . . which is absent from a mere aggregate of words and numerals . . . but the graphic is winning its way . . . even though many of the nearby technical exhibits are merely booths filled with many things.

The editor would like to comment on some of the exhibits, but the space had better be given to other delegates who were at New Orleans. The first speaker is—your name, please!

Health Education and Publicity Headquarters—Wall material came from various sources for the display at New Orleans. Classified portfolios were supplied by Social Work Publicity Council, 130 E. 22d St., New York, N.

Y., with other portfolios from health agencies and commercial groups.

The collection was classified as follows:

Annual reports; campaigns; house organs; bulletins; meetings; newspapers; radio; dramatic material; exhibits and expositions; money raising, letters of appeal; magazine articles; pictorial publicity, photographs, maps, diagrams, visualization, motion pictures, strip film, posters; printed matter, mimeograph, offset; health education, school, adult; health topics; periodicals; city and county; state; national; commercial; unclassified (including syphilis in press and radio).

These portfolios may be consulted at any time at the Council's headquarters in New York City.

Movies at the Annual Meeting—There ought to be a chance for health workers to see new motion pictures and other projection material. So far no satisfactory plan has been worked out. Suggestions would be welcomed by the Program Committee.

The following pictures were available at New Orleans:

"Sylvatic Plague" and "Psittacosis," by Dr. K. F. Meyer, University of California, San Francisco, Calif.

"Malaria," by Winthrop Chemical Company, New York, N. Y.

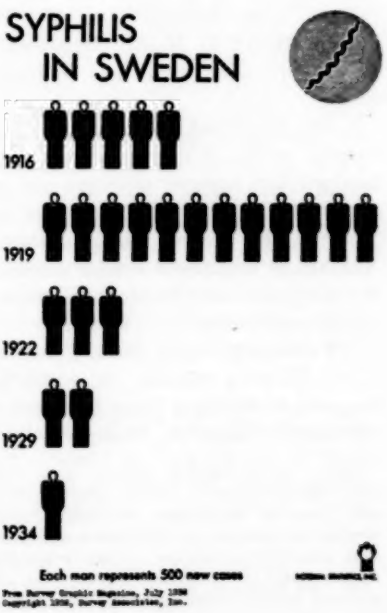
"Behind the Shadows," by National Tuberculosis Association, New York, N. Y.

"For All Our Sakes," a talking slide film by American Social Hygiene Association, New York, N. Y.

More Than Six Million Readers—And the end is not yet for the *Survey Graphic* article on syphilis, "The Next Great Plague to Go," by Dr. Thomas Parran. The article appeared in *Survey Graphic*, July, 1936. In abbreviated form it appeared in *Reader's Digest*. The *Graphic* reprint has reached 35,000 circulation. The *Digest* reprint approximates a 300,000 circulation. Here we have a total of nearly 2,300,000. Recently a rough count was made of the circulation of newspapers which carried the gist of the material in news or editorial columns. The grand total runs above 6,000,000.

This article seems to be a "natural" which we are wise to play for all it is worth. The *Digest* reprint (address at Pleasantville, N. Y.) is cheap, light, and small, and so is good for fairly wide circulation. The *Graphic* reprint is fuller in treatment, on better paper, better illustrated, more dignified in appearance. It should impress editors and broadcasters, program committees of clubs, leaders in the community. Single copies, *10 cents*, and *8 cents* down to *5 cents* in quantities.

The picture charts may be displayed at various times and places. In letter size, *20 cents* for the set; 17 by 22 inches, *50 cents*. The larger size should be useful at state conferences of social work, and at many kinds of



state conventions. Better add a card telling how to get reprints or charts.

The charts might be reproduced in a monthly bulletin or elsewhere. Before doing so please write for permission and the credit line which should accompany any reproduction. Address: *Survey Graphic,* 112 E. 19th St., New York, N. Y.

"The Health Officer" for November—A good budget of health education material appears in the November, 1936, issue of *The Health Officer. Free* from U. S. Public Health Service, Washington, D. C. But we do wish that mechanically it could be made more legible. There is too much of too small type; too much space between letters and between words; italics, on page 235; many of the lines too long for the size of the type.

"Posters Picture Public Health" announces a group of posters produced by the Federal Art Project, W.P.A., New York City. These silk screen posters come through Dr. W. H. Runcie, Board of Health, Hempstead, N. Y. *10 cents* each; less in quantities.

"The Press and Poliomyelitis" is a careful review of newspaper clippings received last summer reporting use of Armstrong-Harrison nasal spray in an outbreak in several southern states. The article might well furnish material for a special memorandum to editors in a like situation.

"Publicizing Public Health," by Dr. C. C. Slemons explains the expanded program of Michigan State Department of Health. Says Dr. Slemons:

> When public opinion gets in step with the expanding public health program, then will practical application of public health service be more nearly correlated with current scientific knowledge. Thus arises the urgent need for a concerted effort on the part of public health agencies not only to inform a passive public of the negative values of disease prevention and of positive health measures, but to carry forward the story of public health that the public will actively demand the best possible health protection for every individual.
>
> Recognizing this passive attitude toward public health and the immediate need for active coöperation, the Michigan Department of Health inaugurated this year an educational news program designed to maintain a continuing contact with the public in the interpretation of public health activities and conditions. A full-time trained journalist has been placed in charge of publications and a news service established under the administration of the Bureau of Education. Through this bureau, then, is correlated all news releases to both the lay and the professional press pertaining to the activities of the various administrative bureaus of the department and to local health conditions, as well as all literature designed for positive health education.

One feature of this program is

> A series of news releases sent out each week to more than 400 daily and weekly newspapers of the state. In addition, these articles are sent to all of the full-time health officers of Michigan, to the *Michigan Municipal Review,* and to the established news syndicates in the state. The number of articles each week varies from one to several, but it has been found that better coverage is obtained by concentrating upon a single effective release. Every effort is made to meet special requests from editors and from daily reporters for "feature" articles concerning the policies and program of the health department. More timely news "breaks" are released immediately to the daily press through the capitol press bureau.
>
> These articles are written for the newspaper-reading public in the typical news fashion—brief, timely, simply told, and as interestingly written as possible. Naturally, since they interpret state-wide health conditions, the articles are broad in scope, and, hence, lose some of the local appeal that an editor may demand. This is offset to some extent through the coöperation of the local health officers who are urged to correlate local data with our releases in making them more newsworthy for the local press.
>
> The sending of these news releases to the local health officer serves a two-fold purpose. Not only are we providing him with materials and ideas for publicizing the health program, but we are also building for a

cordial relationship between local and state departments. Since the foundation of any public health service lies in the direct services rendered by the local health department, the cause of public health will be advanced to the degree that we can aid such departments and stimulate a demand for a trained health organization in every community.

"A Story of Yellow Jack" tells of a Memphis revival of the professional play, "Yellow Jack," and reproduces a newspaper article used in the promotion of the play.

The Industrial Nurse Teaches—The nurse in industry may do an extensive teaching job as outlined by Lucy DeMuth in "Health Teaching in the Small Industry."

Then there are bulletin boards for the nurse to utilize:

Bulletin boards throughout the plant may be used for safety instruction, while those in the dressing-rooms may be concerned with matters of health. The use of bulletin boards is of particular advantage where women are employed. The supply of material for this purpose is almost limitless. It can include every subject from the care of the hair and the nails to the latest research on cancer. Excellent articles appear almost daily in our current magazines, nursing literature, and newspapers. Very often they are lengthy and written in terms difficult for the average shop worker to interpret, but they can be excerpted or rewritten in a simpler form.

Many organizations throughout the country distribute without cost pamphlets and bulletins on health. Pamphlets that are too lengthy may be kept in the first aid room to be distributed to interested individuals. A list of this reading material may be kept posted on the bulletin board. To create interest in health information the employees may be encouraged to bring in articles they have found interesting. If these have news value, they can be placed on the board for others to read.

In *Public Health Nursing*, 50 W. 50th St., New York, N. Y. Oct., 1936. *35 cents.*

Hygeia, November, 1936—Published by A.M.A. at 535 N. Dearborn St., Chicago, Ill.

The plight of the hospitals (insurance complications) . . . "Willie, pull your stomach in!" (posture) . . . Public safety a world ideal . . . Some vignettes from tuberculosis history (Welch, Biggs, Osler, Trudeau) . . . Carbon monoxide poisoning ("artificial respiration is easy") . . . It depends on the weather (effect of climatic conditions) . . . Winter insects versus health . . . Albert Neisser (discoverer of the cause of gonorrhea) . . . Broken bones . . . The doctor abroad—Italy . . . James Watt, inventor of the spirometer . . . Green vegetables all the year . . . Curious stories about health (about Captain Cook) . . . Eavesdropping on the doctor: a case of pneumonia . . . The meningococci (another germ we live with) . . . The transparent woman (the model of a woman) . . .

In "School and Health":

Physical growth as a cause of adolescents' problems . . . Teaching health in a new college (Rollins).

What the Newspaper Syndicates Offer—Some 21 writers of newspaper health columns are reported in *Editor and Publisher Thirteenth Annual Directory of Features.* The authors, as listed: Dr. Louis Berg; George W. Crane; Dr. Edmund B. Chaffee; Dr. Cutter; J. J. Gaines, M.D.; Marie Craig, R.N.; Jane Stafford; Dr. Morris Fishbein; Dr. Sophia Brunson; Dr. Logan Clendening; Laurie (health exercise); Dr. Iago Galdston; Dr. William Brady; Dr. Louis E. Bisch; Dr. Foster D. Snell; Dr. Major G. Seelig; Dr. James W. Barton; Dr. James Barton; Dr. C. N. Crisman; Dr. Royal S. Copeland; Beulah France ("Your Nurse Says"). *Editor and Publisher,* Times Bldg., New York, N. Y. Sept. 26, 1936. *10 cents.*

"Great Pox" in Time—Under this heading is reported Dr. Parran's becoming president of "that ancient and honorable organization" which "convened for its 65th annual meeting" in New Orleans—the A.P.H.A.

The article traces syphilis in the

Second Commandment, and down through the ages until in 1929 the St. Louis *Post-Dispatch* "specifically mentioned syphilis in a report of a St. Louis meeting of the National Society for the Prevention of Blindness." Then follows recent history. But

> Nowhere is this taboo more rigidly enforced than on the screen or in radio. Cinema producers are well aware that any reference to the subject, regardless of good motives or public purpose, will only make trouble for themselves. Columbia Broadcasting will not permit the word "syphilis" to go out over the air from its stations. National Broadcasting this year gingerly permitted Dr. Parran and two other authorities to mention the word in broadcasts.

Portraits of Dr. Rice and Dr. Parran accompany this article in *Time*, 350 E. 22d St., Chicago, Ill. Oct. 26, 1936. *15 cents.*

Health Education in September Journal—The September, 1936, issue of *American Journal of Public Health* contained material of value to health educators.

"Administration of Health Education and Health Supervision in Negro Colleges," by Cornely (pages 888–896).

"What Is the Air Hygiene Foundation?" (page 896) announces a new source of background material. The address was not given.

"Milwaukee's Well Advertised Gastrointestinal Epidemic," by Koehler, pages 921–923, gives the facts about "one of those situations."

"A Great Medical Library," editorial, pages 930–932, is something for all readers to go over. Some newspaper editorial writers would appreciate receiving copies of such material.

"Poliomyelitis," pages 933–934, gives background data likely to be of value.

In "Books and Reports," note comments on "Vitality," page 942, and on "That Balanced Diet," page 947.

"A Selected Public Health Bibliography" includes two paragraph titles, page 950: "Unpleasant Thought-of-the-Month," and "Viewers-with-Alarm Please Note."

Do You Tell Them What You Like?—Why are easily named radio favorites so well paid for their broadcasting? Because so many people wrote, or telephoned, or telegraphed their appreciation.

Why are various men and women permitted to buy and use radio time for broadcasting dubious health information or advertising doubtful or dangerous remedies or treatments? Because so few people have taken the trouble to object to these most dangerous of "public enemies."

Light on the above and on other aspects of "The Art of Pleasing Everybody," via radio, will be found in an article so named in *Atlantic Monthly*, 8 Arlington St., Boston, Mass. Oct., 1936. *40 cents.*

Stream Pollution Exhibit—Executed by a window display firm from designs by staff members, the Washington State Department of Health, Seattle, produced an effective display which has been shown at fairs and expositions.

As described by Dr. A. S. Baker, health education adviser:

> The length is 13 feet over all and the height is 8½ feet. The box containing the scene is about 8 feet long, 2½ feet high, and 2½ feet deep.
>
> The scene depicts a mountain background, a city middle ground, and two farms in the foreground, with a stream of running water as a front border (does not show in the picture). In the center a bridge and to the left of this, a pipe (the outfall of the city sewer into the stream) with a sign "Keep Away, City Sewer."
>
> The water in the stream flows from right to left in a metal trough painted to look as natural as possible and containing gravel and pebbles. There is a division in the trough under the bridge to keep the clear water in

the upper end of the stream (right hand side) from mixing with the stained water (representing sewage) in the lower part of the stream (left hand side). The water is kept circulating by two pumps driven by an electric motor mounted under the box. When in operation the two streams appear to mix at the bridge, the outfall sewer pipe pouring its stream of stained (brown ink is used as stain) into the stream at this point. The right hand farm where the water is clear looks prosperous and healthy; the left hand farm is dilapitated, run down, and deserted.

The front panels are finished with dark green fabricoid and the lettering is sawed-out-block in white.

Dr. Baker will loan a photograph to show the general effect.

Child Health and Health Education—One of the educational services of the American Child Health Association was the preparation of carefully classified and annotated reference lists to suggest some sources of reliable, helpful and inexpensive material on various aspects of school health work. This particular service will be continued during the coming year.

The lists are organized in relation to problems confronting administrators, supervisors, teachers, physicians, nurses, and others engaged in school health education.

Single copies of mimeographed or printed reference lists are available to these leaders free of charge. Address: School Health Education Service, 1201 16th St., N.W., Washington, D. C. A set, or individual lists will be sent on request.

"Health Education in Elementary Schools." Mimeographed. Revised. January, 1936. 6 pp. Procedures outlined, references given for specific steps in the development of health education activities in the classroom.

"Health Education—A Brief Bibliography for Administrators and Instructions of Health Education in the Junior and Senior High Schools." Mimeographed. Revised. March, 1936. 5 pp. Contains classified, annotated references including recent articles in professional periodicals.

"Some References on Child Care and Training." Mimeographed. Revised. June, 1936. 6 pp. Prepared for instructors of child care classes in secondary schools and for Parent-Teacher groups.

"Some References on the School Lunch." Mimeographed. January, 1936. 5 pp. An annotated list of references classified under the following headings: general references; organization and management; educational uses of the school lunch; the school lunch and the relief program.

"Health Plays for School Use." Mimeographed. Revised. January, 1936. 6 pp. An annotated list of plays selected with reference to age groups.

"Health Education in the Rural School." Mimeographed. January, 1936. 6 pp. Selected list prepared especially for teachers and parents in rural communities.

In general these lists are suggested as models for consideration by all who make up lists of reading references. The form of the references, and the types of information given will be helpful for a half dozen references, or less, as well as for the extensive bibliography.

The present editions of the child health bibliographies lack some street addresses which might easily have been included. Also there is some needless mention of Government Printing Office in addresses for government publications.

(The inclusion of street addresses is suggested: (1) to cut down the cost of government; (2) to save time in the delivery of mail; (3) to make more sure the correct delivery of mail to some addresses.)

HEALTH EDUCATION

The references below, on adult or child health education, are taken from *Health Index*, National Health Library, 50 W. 50th St., New York, N. Y.

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Greenman, R. H. Helping the doctor. National Tuberculosis Association, *Bulletin* (New York City) 22:118–19, Aug., 1936.

Kniberg, E. G. Classroom health activities. Part II. *Public Health Nursing* (New York City) 28:467–70, July 1936 (concluded).

Lloyd, W. M., M.B., D.P.H. Health and physical education. *Medical officer* (London) 55:207–8, May 23, 1936. Need for "an organized (not spasmodic) system of health education."

Neuhoff, F. A. Illinois dental health education program. *Bulletin of the Chicago Dental Society* (Chicago) 16:5–7, July 2, 1936.

Scott, J. A., M.D., D.P.H. Health education and the work of the National baby week council. *Medical officer* (London) 56: 267–68, July 4, 1936.

Stamp, Lady. Winning the mind. Presidential address. *Journal of the Royal Sanitary Institute* (London) 57:189–92, Oct., 1936. Address at health congress on teaching women about health.

Stimson, Mabel. Utilizing the food clinic in community education. *Hospital Management* (Chicago) 42:25, 60, Aug., 1936.

Teschner, P. A., M.D. Doctors and public speaking. American Medical Association *Bulletin* (Chicago) 31:131–34, June, 1936. American Medical Association offers to physicians a loan library of clipping collections from *Hygeia* for use in preparing health education talks.

FOR EDUCATION AND REFERENCE

One or another of the items listed below may prove useful if but a single copy is sent to the right person in your city or state.

"Altro Becomes of Age." Questions and answers about the workshop for tuberculosis patients after their discharge from the sanatorium. Committee for Care of Jewish Tuberculous, 71 W. 47th St., New York, N. Y. *Free.*

"Conservation of School Children's Eyes," by A. C. Snell. Tuberculosis and Health Assn., 277 Alexander St., Rochester, N. Y. *Free.*

"Diets to Fit the Family Income," by R. S. Carpenter and H. K. Stiebeling. A popularization of an earlier study, adapted to four income scales, thus giving it unusual value. Dept. of Agriculture, Washington, D. C. *Free.*

"A List of Dental Educational Material." Fall of 1936. Bureau of Public Relations, American Dental Assn., 212 E. Superior St., Chicago, Ill. *Free.*

"List of Publications," Social Work Publicity Council, 130 E. 22d St., New York, N. Y. *Free.*

"On the Witness Stand: The Evidence on Compulsory Health Insurance," by J. W. Walch. The author was for it; he studied the subject; now he is against it, and asks and answers 107 questions. Medical Society of State of New York, 2 E. 103d St., New York, N. Y. *10 cents.*

"Vitamin D Milks," by J. A. Tobey. The author, care of Borden's, 350 Madison Ave., New York, N. Y. Reprint. *Free.*

From U. S. Children's Bureau, Washington, D. C.:

"Mortality Among Prematurely Born Infants," by E. D. Dunham (reprint).

"The Social Security Act and Crippled Children," by M. M. Eliot (reprint).

From State Charities Aid Assn., 105 E. 22d St., New York, N. Y. (*free*):

"The Modern Background of Syphilis Control," by J. E. Moore.

"Continuity and Growth of the State Department of Health" (and their bearing on local and federal health administration), by Homer Folks.

From American Medical Assn., 535 N. Dearborn St., Chicago, Ill.:

"Athlete's Foot," by D. D. Levine. (*Hygeia* reprint.) *5 cents.*

"Home Canning for the Diabetic," by F. H. Diamond. (*Hygeia* reprint.) *5 cents.*

"The Skin in Health and Disease," by H. N. Cole. (*Hygeia* reprint.) *15 cents.*

"What to Do for Blind Children," by Park Lewis. 29 pages. *10 cents.*

"The 'Compatible Eating' Fad," by C. W. Lieb. (*Hygeia* reprint.) *10 cents.*

"Glands: Their Influence on Body Build and Behavior," by H. S. Rubenstein. (*Hygeia* reprint.) *15 cents.*

BOOKS AND REPORTS

Cash Relief—*By Joanna C. Colcord. New York: Russell Sage Foundation,* 1936. 263 pp. Price, $1.50.

This book is a genuine contribution in the field of social work since it presents facts concerning a much discussed subject. There has been a growing belief that cash relief was to be preferred to commodity relief, but there were no data available in the United States to substantiate that opinion. Miss Colcord has supplied the facts.

In her search for evidence Miss Colcord made a study of the growth of cash relief since 1930. This was done through a searching analysis of the systems of cash relief in Baltimore, Cleveland, Denver, Detroit, Los Angeles, New York City, Philadelphia, Pittsburgh and San Francisco.

This study has dissipated the fear among social workers and laymen that there would be a misuse of cash grants, resulting in frequent demands for more aid and a refusal to take work when it was offered. The evidence favors cash relief and reveals many of the abuses connected with the order system in which there is overcharging, discourteous treatment, the sale of inferior merchandise, and short weights in many instances. It is possible for the client under the cash system to take advantage of sales and select better food in keeping with his cherished food habits. The Relief Administration favors cash relief since it reduces office expenses and the number of complaints, and leaves more time for the professional staff to make investigations and create a desirable client-visitor relationship.

Human nature is the chief value in social work. There is much concern over the effects of relief of any kind on the mental health of the client. This study provides facts that may be used in considering the mental as well as the physical health of the client. The trained worker realizes that he has not succeeded with a client unless he leaves the client thinking well of himself. Cash relief helps to maintain self-respect. Commodity relief provides an opportunity for merchants to play with self-respect. There is nothing quite so important in the life of the person as his own opinion of himself.

This study can serve as a point of departure for further research in which case studies can be made regarding the effect of the various methods of relief on the human nature of the client.

L. GUY BROWN

Official Report of the Sixth National Training Conference of Scout Executives of the Boy Scouts of America, *New York,* 1936, 990 pp.

The commission report on health and safety, embodied in these transactions, is of interest to public health workers. The Boy Scout program reaches over a million boys and approximately 230,000 volunteer leaders every year. An actively functioning, properly organized and adequately trained Health and Safety Committee is the minimum expected of a local Boy Scout Council in the performance of its responsibilities. Coördination of this work with other community health activities is planned. Emphasis is given to the importance of using pasteurized milk in camps. If pasteurized milk is not available, it is suggested that some substitution such as powdered or canned milk be used rather than take the risk involved in the use of raw milk. Belief is re-

affirmed as to the necessity for a thorough physical examination for every boy entering the movement. Suggestions are made for the further constructive development of education in personal hygiene, public health, safety and first aid. IRA V. HISCOCK

Security Against Sickness — *By I. S. Falk. Garden City, N. Y.: Doubleday Doran.* 423 pp. Price, $4.00.

In the current controversy over the social security issue, both those who favor and those who oppose social insurance programs in the United States point to the results of European experience in support of their claims. It is also contended by both sides that American social security programs, as embodied in the "Social Security Act" or the "Majority Report of the Committee on Costs of Medical Care," have ignored the results of such experience. In light of such contentions the volume reviewed here should provide a most welcome addition to the literature on this subject. Dr. Falk's experience in the field of public health, his work in connection with the researches of the Committee on Costs of Medical Care, and his wide familiarity with European programs of sickness and health insurance eminently qualify him for this authoritative survey of health insurance programs abroad and their interpretation to the American public.

The book is divided into 3 parts. In the first and introductory part the author deals with the need for group payment of medical costs in the United States. He points out that group payment is no new venture even in this country, where it exists in the form of charity, the sliding scale of the physician, in the form of taxation, or even in insurance. The issue is not, then, the individual fee system *or* the group payment plan, but rather the extent to which group payment shall develop and the form which it shall take.

The second part of the book is devoted to a detailed analysis of the administration, organization, and costs of health or sickness insurance in Germany, Great Britain, France, and Denmark. These countries were chosen because their programs have been developed to suit widely varying conditions, because they have served as models for many other countries, and because they represent divergent approaches to the problem of sickness insurance. Perhaps the most significant conclusion to be drawn from the whole study is the wide degree of satisfaction felt in each country with its insurance program, in spite of frank admissions of many weaknesses and deficiencies. This, to some, may seem surprising in view of the contention of a number of critics in this country, that health insurance is not popular where tried and that there is increasing sentiment in favor of its abandonment.

In no country did the author find any strong sentiment in favor of the scrapping of a program once started. This seemed also to be the prevailing sentiment of the physicians, as voiced by the leaders in the profession. Instead, it was found that insurance schemes, once started, tended to expand, both as to the extent of the population covered and in the benefits and services provided.

Another significant trend was the tendency for compulsory to replace voluntary social insurance. Even in Denmark the system is voluntary only in name. Important also, in view of the cry in this country of "state medicine" or "public medicine," was the fact that in not a single country studied was there a drift toward "state medicine" if by that term is meant that the state goes into the business of providing medical services to the public. Dr.

Falk finds, on the contrary, that: "There can be no doubt, however, that health insurance has operated to strengthen the position of the private practice in the insurance countries" (p. 286). In the matter of preservation of the personal relation between physician and patient, free choice of physicians, control by the physician of the professional aspects of the insurance program, and maintenance of the highest professional standards, the physician in the health insurance countries seems to occupy a position of wide independence.

In part 3 of the book, the author attempts to draw some lessons for an American program from European systems as well as from our own experience with workman's compensation legislation. In the last 2 chapters he states the case for compulsory as opposed to voluntary insurance and lays down 19 principles as the basis for an American system of health insurance. The writer feels that compulsory rather than voluntary insurance offers the greatest promise for success. He advocates the divorcing of cash payments from medical service. He believes that health insurance should be extended to all parts of the population to which the costs of medical care and loss of income due to illness are likely to prove a serious economic hazard. The basic problem for solution, as seen by the author, is how to transform costs which cannot be budgeted by the individual, and are likely to prove beyond his ability to pay, into costs which can be budgeted by large groups of people over periods of time, and hence fall well within the individual's ability to pay. Compulsory programs of health insurance, developed by the states with financial assistance and standardizations by the federal government, seem to offer the best solution to the problem.

C. T. PIHLBLAD

Heart Disease and Tuberculosis—*By S. Adolphus Knopf, M.D. Livingston, N. Y.: Livingston Press,* 1936. 108 pp. Price, $1.25.

A glance at the table of contents of *Heart Disease and Tuberculosis* will reveal the scope of this brochure. It epitomizes a life-long experience in dealing with the interrelationships of heart disease and tuberculosis. With 53 figures as illustrations, with 29 major chapter headings and an index, all compressed into 108 pages, it can be readily understood that the author could only cover so broad a subject in staccato paragraphs.

It is a matter of interest that the book was issued by the patients of The Potts Memorial Hospital, and it is for sale through them by The Livingston Press, Livingston, N. Y.

KENDALL EMERSON

Industrial Dust—*By Philip Drinker and Theodore Hatch. New York: McGraw-Hill,* 1936. 316 pp. Price, $4.00.

A bibliography rich in material, United States and foreign, forms the basis of this new book in the field of industrial hygiene. The authors have drawn freely from their own researches and the literature for a sound exposition of the hygienic significance, measurement and control of industrial dust, perhaps the most valuable contribution on this particular subject thus far, especially in the light of present-day agitation for more adequate and proper legislation for the protection of the industrial worker exposed to harmful dusts, the numerous law-suits in which questions pertaining to exposure of employees to dusts and sanitary con trol of the industrial environment are involved, the increasing interest in the teaching of industrial hygiene, the establishment of divisions of industrial hygiene in state departments of health,

and the many controversial points on the subject being discussed by industrial engineers and physicians.

Coöperation between the physician and the engineer is fundamental in the control of industrial dust hazards. "Design of dust control apparatus is an engineering matter but it is often the physician who finally appraises the success of the control system." With this prefatory statement the authors include in their book chapters on the effects of dusts and fumes upon the human organism, physical and chemical factors in pneumoconiosis, permissible dustiness, and medical control of the dust hazard. The medical aspects are given in order to "help the engineer to understand the manner in which hygienic requirements affect engineering design and operation of dust-control equipment." The book is none the less valuable for the industrial physician, who should be acquainted with the engineering aspects of dust control if he is to understand better and intelligently pass upon the adequacy of the plant's efforts to improve the industrial environment of the worker exposed to harmful dusts and fumes.

In keeping with latest thoughts in the matter of disabling illness due to dust the authors state there is no reason, medical or social, for branding a man with first-stage silicosis as disabled because of the serious harm that may thus be done to both industry and the man, inasmuch as the man is thereby prevented from seeking gainful occupation, and the employer, by hiring such a man, opens the door to suits involving the slightest mishap to the "disabled." It is pointed out that in the British Empire, where silicosis legislation has been in force for some years, only the man with advanced silicosis, simple or infective, is considered disabled.

Permissible dustiness is given for quartz, coal dust, cement and limestone, lead, zinc oxide, manganese; but, according to the authors, there is no authoritative available data which would justify the adoption for medicolegal purposes of standards of permissible dustiness for each harmful dust. Standards may be used as "basic criteria in the design and operation of dust control equipment and as general guides in the appraisal of working conditions," but the authors conclude the use of these figures for medicolegal considerations is unsound because of the limiting factors of mineralogical composition, "dust floods," and industrial selection, involving the process of natural selection of the fittest and the continuous elimination from industry of the unfit.

Pages 80 to 166 give methods of analyzing the extent of dust hazards, including the dust survey, determination of dust concentration, determination of particle size, chemical and mineralogical analysis of dust. Extremely useful information is given for the laboratory worker.

A short chapter on Methods for the Control of Industrial Dusts is divided into 2 parts: (1) environmental or engineering control, (2) personal or medical control. An appeal is made for initial physical examinations and periodic examinations thereafter. Engineering control is divided into 3 groups: eliminating the sources of dust, preventing the dispersion of dust at its source, and providing individual protection.

The book describes the principles and design of local exhaust systems, air-cleaning apparatus, air filters, and finally there is a historical review of the use of dust respirators and air masks, including the methods of testing respiratory protective equipment and filter materials.

The book is well illustrated; its

tables and figures are clear and well edited; and the bibliography is comprehensive. The authors have provided name and subject indices.

The reviewer commends the volume to the industrial physician, the industrial engineer, the industrial hygienist, the industrial nurse, the safety engineer, the public health laboratory technician, the teacher in industrial hygiene in the medical school, and the school of public health, and the health officer.

BERNARD S. COLEMAN

The New Healthy Living—*By C.-E. A. Winslow and Mary L. Hahn. New York: Merrill,* 1935. Book I, 332 pp. Price, $.84. Book II, 460 pp. Price, $1.00.

Among the early health books for classroom use on the market was the New Healthy Living series which was received enthusiastically by teachers and health educators, because they were prepared by two individuals who knew the proper approach in the health education field. Professor Winslow offered the rich health education background and Miss Hahn the successful teacher's ability to select the right material and present it in an interesting, appealing fashion to school children.

After 6 years of success in the supplementary textbook field this series has been revised. The books are very readable for the age of children for whom they were prepared. Simple experiments that can easily be tried in the classroom, anecdotes of famous persons whose success has been achieved by recovered health, the importance of health in every line of service and activity, simple treatment of communicable disease problems, community and home sanitation, state and federal health supervision and services are only a few of the subjects that intrigue the adolescent readers to go on from chapter to chapter.

Physiology is introduced and the subject of mental hygiene is very pleasingly handled. So when they close the books they are ready to put a high valuation on health, concretely and abstractly. Many fine illustrations, an index in both books and a glossary in Book II also make for the excellence of these school books.

ANNA B. TOWSE

Idols and Invalids — *By James Kemble, Ch.M., F.R.C.S. New York: Doubleday, Doran,* 1936. 328 pp. Price, $3.00.

The ills of the flesh are always interesting when they are the ills of famous persons. In this well printed book a Fellow of the Royal College of Surgeons diagnoses the ailments and performs post-mortems on a score of the most celebrated figures in history. He does it exceedingly well, for he has a pleasing style, in which he deftly mixes philosophy with fact, and medicine with history. In Great Britain the book was published under the somewhat apt title, "Hero Dust."

The narratives begin with a study of Lord Byron, whose personality was acutely affected by his lameness, and end with Omar Khayyam, the Persian poet who was a centenarian in the hazardous 12th century. In between, the author describes the medical and psychological histories of Columbus; Judge Jeffreys, whose sufferings from stone led to the Bloody Assizes; Louis XV, and his procession of mistresses; the baleful Borgias; Cleopatra, the brilliant product of centuries of inbreeding; Lord Nelson, the perpetual invalid; Henry VIII, the syphilitic; Queen Anne, the ugly; and Mary Queen of Scots, the comely; Epicurus, the epicurean; the amatory Catherine the Great; John Milton, who was not always blind; and Beau Brummel, who lived for a while in elegance and died in misery.

In the preparation of this interesting book the author has had access to many rare documents. The facts presented seem accurate, and the conclusions drawn from them are reasonable, with one noteworthy exception. The author asserts the generally discarded theory that syphilis originated in America and was brought to Europe by Columbus and his crew. Most authorities seem agreed today that the red plague had existed in mild form in Europe long before the celebrated explorer discovered America and the charms of the diseased maidens of Hispaniola.

Although the general reader will encounter in this enjoyable book occasional words and phrases that are more or less typical of the obscurant terminology employed by medical writers, he will find the book a most entertaining and enlightening one. The sanitarian should find it fascinating.

JAMES A. TOBEY

Slim and Supple—A New System of Swedish Exercises for Young and Old—*By Barbro Leffler-Egnell. New York: Appleton Century,* 1936. 209 pp. Price, $2.00.

This text offers a system of Swedish exercises for women, designed to accomplish the purpose indicated in the title.

This is another of the texts on exercises designed basically to reduce weight and restore the "girlish" figure. The text is profusely illustrated with pictures of the various exercises. The directions are clear. To the layman the purpose of some of them would not be apparent. The specific aim and purpose of each exercise should have been mentioned in connection with each exercise. This has been done in some cases.

Some of these exercises are difficult to do in good "form" unless given under definite personal instruction and careful supervision. Some, especially if unsupervised, would tend toward sacroiliac strain. CHARLES H. KEENE

British Masters of Medicine—*Edited by Sir D'Arcy Power. Baltimore: Wood,* 1936. 242 pp. Price, $3.00.

Close in the wake of *Great Doctors of the Nineteenth Century* comes this other book of biographical sketches confined entirely to the British.

Beginning with Harvey (1578–1657), sketches of a number of men who have made outstanding contributions to medicine down to and including Ernest Henry Starling (1866–1927) are given. The sketches have been written by those who have been attached to the institutions which their heroes made famous. They appeared originally in the *Medical Press and Circular* in a series of articles carrying the same title as the book. They have now been collected in one volume and arranged in chronological order with some additions and minor corrections.

This book has the peculiar value of calling to our attention some names which are all but unknown to the general profession as well as to the public. Notable among these, for example, is Sir John Floyer, who was the first man to count the rate of the pulse and respirations by the minute, having invented what he called the "Pulse Watch" for the purpose. He was also the first to estimate the blood volume and compare it with the body weight, the results being remarkably near to those obtained by modern methods. He also tried a number of very ingenious experiments, was the first to describe emphysematous change in the lung, and to show that spasmodic asthma was due to constriction of the bronchi. His biographer states very properly that his work has never been sufficiently recognized, even in England.

The book is well written and unusually well illustrated. It deserves a place in the library of every physician.

MAZŸCK P. RAVENEL

Quarterly Bulletin of the Health Organisation of the League of Nations, Vol. V, No. 1 (Mar.), 1936.

This issue of the *Quarterly Bulletin* is unusually interesting as it gives a valuable report of the Pan-African Health Conference held November 20 to 30, 1935. While a little late in publication, the material is of great value. There are special reports on yellow fever, plague, malaria, typhus fever, animal diseases communicable to man, etc.

The report on yellow fever is particularly interesting, giving historical reviews of yellow fever in Africa and South America. Perhaps the most striking report is that on jungle yellow fever. There is a special report on yellow fever in West Africa.

Another section is devoted to insects in aeroplanes, on which our own Public Health Service has done valuable work. Bubonic plague is well considered at some length.

The report on animal diseases communicable to man deserves attention. It is apparent that bovine tuberculosis is spreading with considerable rapidity in certain parts of French West Africa and the British Cameroons, and in Northern Rhodesia a very large percentage of the cattle is affected.

There has been no proof in South Africa that bovine tuberculosis is responsible for human cases, though the disease in cattle is just as virulent as in other countries, and the reporter, Dr. P. J. Du Toit, recognizes the transmission which has been proved in other countries.

Altogether, this number of the *Bulletin* is of unusual interest and is worthy of close study.

MAZŸCK P. RAVENEL

BOOKS RECEIVED

A SYNOPSIS OF HYGIENE. By W. Wilson Jameson and G. S. Parkinson. 5th ed. London: Churchill, 1936. 623 pp. Price, $6.75.

A LIBRARY HANDBOOK FOR SCHOOLS OF NURSING. Prepared by the Subcommittee on the Nursing School Library of the Curriculum Committee, National League of Nursing Education. New York: National League of Nursing Education, 1936. 264 pp. Price, $2.50.

EUGENICAL STERILIZATION. A REORIENTATION OF THE PROBLEM. By The Committee of the American Neurological Association for the Investigation of Eugenical Sterilization. New York: Macmillan, 1936. 211 pp. Price, $3.00.

PRACTICAL EXAMINATION OF PERSONALITY AND BEHAVIOR DISORDERS, ADULTS AND CHILDREN. By Kenneth E. Appel and Edward A. Strecker. New York: Macmillan, 1936. 214 pp. Price, $2.00.

KEEPING YOUR CHILD NORMAL. By Bernard Sachs. New York: Hoeber, 1936. 148 pp. Price, $1.50.

TO RAISE THESE HALT. By Fred Rothermell. New York: Lee Furman, 1936. 350 pp. Price, $2.50.

THE HAY SYSTEM OF CHILD DEVELOPMENT. By William Howard Hay and Esther L. Smith. New York: Crowell, 1936. 232 pp. Price, $2.00.

A TEXTBOOK OF BACTERIOLOGY AND ITS APPLICATIONS. By Curtis M. Hilliard. rev. ed. New York: Ginn, 1936. 339 pp. Price, $3.50.

CURRENT SOCIAL PROBLEMS. By William Withers, Agnes Snyder and Carlton Qualey. New York: Prentice-Hall, 1936. 302 pp. Price, $2.80.

NUTRITIVE AND THERAPEUTIC VALUES OF THE BANANA. A Digest of Scientific Literature. By Research Department, United Fruit Company, Boston, Mass., 1936.

MANUAL OF MODERN COOKERY. By Jessie Lindsay and V. H. Mottram. London:

University of London Press, 1930. 316 pp. Price, $1.35.

FEEDING, DIET AND THE GENERAL CARE OF CHILDREN. By Albert J. Bell. 3d ed. New York: Putnam, 1936. 316 pp. Price, $2.00.

PRESS TIME. A BOOK OF POST CLASSICS. *New York Evening Post*. New York: Books, Inc., 1936. 383 pp. Price, $2.00.

MEDICAL CLASSICS. Compiled by Emerson Crosby Kelly. Vol. I, No. 1, Sept., 1936. Baltimore: Williams & Wilkins. Subscription, $10.00 in United States. Foreign, $10.50.

THE LAST THIRTY YEARS IN PUBLIC HEALTH. By Sir Arthur Newsholme. London: Allen & Unwin, 1936. 410 pp. Price, $4.75.

SNOW ON CHOLERA. Reprint of Two Papers by John Snow. New York: Commonwealth, 1936. 191 pp. Price, $2.50.

HEALTH AND ENVIRONMENT. The Elements of Sanitary Science. By Jean Martin White, R.N. Philadelphia: Davis, 1936. 209 pp. Price, $2.50.

DIABETIC MANUAL—FOR PRACTITIONERS AND PATIENTS. By Edward L. Bortz, M.D. Philadelphia: Davis, 1936. 222 pp. Price, $2.00.

THE RIDDLE OF WOMAN. By Dr. Joseph Tenenbaum. New York: Furman, 1936. 477 pp. Price, $3.50.

ADVENTURES IN RECREATION. By Weaver Weddell Pangburn. New York: Barnes, 1936. 138 pp. Price, $.72.

HEALTH GUIDES AND GUARDS. By Francis P. Wall and Louis D. Zeidberg. New York: Prentice-Hall, 1936. 208 pp. Price, $1.35.

LABORATORY MANUAL FOR CHEMICAL AND BACTERIAL ANALYSIS OF WATER AND SEWAGE. 2d ed. By Frank R. Theroux, Edward F. Eldridge and W. LeRoy Mallmann. New York: McGraw-Hill, 1936. 228 pp. Price, $2.50.

FACING THE FUTURE WITH THE CHARACTER BUILDING AGENCIES. By Arthur A. Schuck. Prepared by National Character Building Agencies in coöperation with the 1936 Mobilization for Human Needs. Distributed by Community Chests and Councils, Inc., 155 East 44th St., New York, N. Y. 32 pp. Price, $.10.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

All about Hormones — Intended for the educated laity, this review of present knowledge of the functions of the ductless gland will enlighten all sanitarians, except the few who know about physiology.

COLLIP, J. B. Hormones. Sci. Month. Nov., 1936, p. 411.

Ascertaining Effectiveness of Disease Control Measures—Putting specific tuberculosis control methods to statistical tests is essential if a public health program is to be evolved which will be both flexible and efficient.

DOWNES, J. A Study of the Effectiveness of Certain Administrative Procedures in Tuberculosis Control. Milbank Mem. Quart. 14, 4:317 (Oct.), 1936.

Telling the Public—An excellent series of discussions for the lay public on diabetes, appendicitis, sight conservation, poliomyelitis, colds, sleep, quacks, medical problems, etc., conducted by the New York State Medical Society.

EPSTEIN, A. A. *et al.* What the Community Should Know about Diabetes, etc. New York State J. M. 36, 18:1322 (Sept. 15), 1936.

Water Analysis Discussed—As it is possible that typhoid bacilli may persist longer than organisms of the coli-aerogenes group in water treated with chlorine, the authors suggest the reconsideration of the significance of the latter organisms as a standard of safety.

HEATHMAN, L. S. *et al.* Resistance of Various Strains of E. Typhi and Coli-aerogenes to Chlorine and Chloramine. Pub. Health Rep. 51, 40:1367 (Oct. 2), 1936.

Our Knowledge of Poliomyelitis—Compared to other communicable diseases, polio is not an important cause of death. For the present, a successful vaccine is not available and chemical prophylaxis is decidedly in the experimental stage. About the only preventive measures for susceptible ages are: abstaining from unnecessary contacts during epidemics; guarding against excessive strain; reporting suspicious illnesses.

LEAKE, J. P. Poliomyelitis. J.A.M.A. 107, 14:1094 (Oct.), 1936.

Nutritive Values of Raw and Pasteurized Milk—Nutritionists will want to know about this study even though the results seem not of practical importance. Third generation rats fed pasteurized milk and wheat showed evidence of vitamin deficiency not found in rats fed raw milk and wheat.

MATTICK, E. C. V., and GOLDING, J. Relative Value of Raw and Heated Milk in Nutrition. Lancet 2, 12:702 (Sept. 19), 1936.

More Trichinosis Than You Suspect—Examination of muscle tissues taken from random autopsies in California (none of the patients ever having shown clinical signs of trichinosis) revealed a 24 per cent infection of Trichinella spiralis. The author reminds us that under present methods of meat inspection, the consumer must assume the responsibility for thorough cooking of all pork.

MCNAUGHT, J. B., and ANDERSON, E. V. The Incidence of Trichinosis in San Francisco. J.A.M.A. 107, 18:1446 (Oct. 31), 1936.

The Cinderella of Medicine—Cautioning health authorities not to neglect gonorrhea in their renewed drives for the control of syphilis, this author breaks down reported cases into age and sex groups which are significant guides to the application of preventive measures.

NELSON, N. A. Gonorrhea. Milbank Mem. Quart. 14, 4:328 (Oct.), 1936.

As Others See Us—Our hodgepodge of local health administrative units is observed by a British sanitarian. His findings prove a good antidote to any delusions of grandeur from which we may suffer.

PICKEN, R. M. F. Public Health in the United States of America. Brit. M. J., 3951: 631 (Sept. 26), 1936.

Vitamins and Infection—Dogs fed a diet deficient in vitamin B appeared to be more susceptible to artificial infection with *S. aureus* and lost twice as much weight after infection as did the control animals.

ROSE, S. B., and ROSE, W. B. Bacterial Resistance in Vitamin B Deficient Dogs. J. Infect. Dis. 59, 2:174 (Sept., Oct.), 1936.

What to Do About Heart Diseases—Half or more of all cardiac cases are among the elderly. What to do about the other cases caused by syphilis, rheumatic fever, etc., is discussed for the benefit of the public health nurse, but the paper has something in it for every health worker.

SAMPSON, J. J. Heart Disease as a Public Health Problem. Pub. Health Nurs. 28, 10:637 (Oct.), 1936.

International Vital Statistics—As a fairly reliable indication of the sanitary, medical, and social progress of a nation, this author presents an interesting study of the "natural" deaths compared to the total deaths in a number of countries. The United States enjoys a favorable position.

SAND, R. Changes in the Death Rate Since the Seventeenth Century. Milbank Mem. Quart. 14, 4:311 (Oct.), 1936.

ASSOCIATION NEWS

THOMAS PARRAN, M.D., PRESIDENT
ARTHUR T. McCORMACK, M.D., PRESIDENT-ELECT

AT the Sixty-fifth Annual Meeting of the American Public Health Association in New Orleans, November 20–23 Walter H. Brown, M.D., of Stanford University, Palo Alto, Calif., retired from the office of President, and Thomas Parran, M.D., Surgeon General of the U. S. Public Health Service, became President for the year 1936–1937. The new President-Elect is Arthur T. McCormack, D.Sc., LL.D., M.D., D.P.H., State Health Commissioner of Kentucky.

Arthur T. McCormack was born in Nelson County, Ky., August 21, 1872, the son of Dr. Joseph Nathaniel McCormack and Corrine Crenshaw. In 1893 he entered the College of Physicians and Surgeons, Columbia University, New York, from which he received the degree of M.D. in 1896. Detroit College of Medicine and Surgery made him a D.P.H. in 1925; Berea College gave him a D.Sc. in 1926; Transylvania College conferred an LL.D. in 1930.

He began practice at Bowling Green, Ky., in 1897, and was shortly thereafter appointed Health Officer of Warren County. From 1898 to 1912 he served as Assistant State Health Officer of Kentucky. Since 1912 he has been continuously State Health Officer or State Health Commissioner and Secretary of the State Board of Health.

He was Surgeon General, Kentucky National Guard, 1900–1908; Lieutenant, Medical Reserve Corps, U.S.A., 1911–1917; promoted to Major upon the entrance of the United States in the World War in 1917, and organized

Dr. Arthur T. McCormack

Base Hospital Number 59. When about ready to proceed overseas, he was ordered to Panama as Chief Medical Officer of the Canal Zone with the grade of Lieutenant Colonel. He completed construction of the Ancon Hospital and controlled an epidemic of cerebrospinal meningitis on the Japanese S. S. Anyo Maru, for which he received the personal thanks of the Mikado.

In 1901 he founded the *Kentucky Medical Journal*, of which he has since been editor and a director. He organized and served as Dean of the School of Public Health, University of Louisville; Secretary of the Kentucky State Medical Association for the past 26 years; is a member of the Gorgas Memorial Institute; member of the National Health Council; Fellow of the American College of Surgeons; member and officer of the American, Kentucky, and Jefferson County Medical Associations; Past-President and Secretary of the Medical Veterans of the World War; Past-President of the Conference of State and Provincial Health Authorities of North America; Past-President of the Kentucky Conference of Social Work; and is now Chairman of the Kentucky Social Security Commission.

Originating the idea of administering public health in rural communities through local full-time health departments, with the county as a unit and operating under the supervision of a central authority, Dr. J. N. McCormack, his father, did the pioneer work in promotion of this idea and lived to see several full-time county health units successfully functioning in his state.

Dr. Arthur T. McCormack has carried the work forward so well that today not only three-fourths of the total population of Kentucky have whole-time public health administration, but fully one-fourth of the people in rural communities in the United States and a large proportion of those in Canada are enjoying health protection furnished by local full-time health departments patterned after the Kentucky model.

Dr. McCormack has been a member of the A.P.H.A. since 1919, was made a Charter Fellow in 1923, and is a Life Member.

DR. CUMMING ELECTED AN HONORARY FELLOW

DR. HUGH S. CUMMING, the former Surgeon General, was made an Honorary Fellow of the American Public Health Association at the recent New Orleans Annual Meeting. Dr. Cumming's accomplishments in the public health field are so outstanding and so numerous that this is an honor he richly deserves.

TRIBUTE TO MEMBERS OF LONG STANDING

THE presentation of a beautiful certificate to each member who has been affiliated with the American Public Health Association for 40 years or more was an interesting and touching ceremony at the banquet at the New Orleans Annual Meeting. Two of the eight members concerned, namely Dr. John Harvey Kellogg and Daniel W. Mead, were there in person. The certificates for the remaining members who were not able to attend were received as follows: Dr. Mazÿck P. Ravenel for Dr. William C. Woodward; Dr. Henry D. Chadwick for Mr. Robert Spurr Weston; Dr. Henry F. Vaughan for Dr. George A. Soper; Dr. Angel de la Garza Brito for Dr. Jesus E. Monjaras; Dr. Clarence L. Scamman for Dr. Charles V. Chapin; and Dr. Carl E. Buck for Marion Talbot.

PUBLIC HEALTH ASSOCIATION OF NEW YORK CITY—NEW AFFILIATED SOCIETY

THE request of the newly formed Public Health Association of New York City for affiliation with the American Public Health Association was accepted at the New Orleans

Annual Meeting. The officers are: *President,* Dr. Donald B. Armstrong; *First Vice-President,* Dr. John L. Rice; *Second Vice-President,* Hazel Corbin; *Secretary-Treasurer,* Frank Kiernan.

The first scientific meeting of this new affiliated society will be held on December 3, 1936, at the George Washington Hotel. The society is made up of those Fellows and Members of the American Public Health Association living in Metropolitan New York City who expressed their desire to become affiliated. At the present time the membership numbers about 300.

DEATH OF ROSS L. LAYBOURN

OUR meeting in New Orleans was marred by one very sad incident. On Monday morning, October 19, Ross L. Laybourn, the Director of the Bacteriological Laboratory of the State Board of Health of Kansas, experienced a heart attack while on his way to breakfast. He soon regained consciousness, was removed to the nearest hospital, and later to a government hospital, since he was a reserve officer in the Army. He died November 10.

Mr. Laybourn was an exceedingly active member of our Laboratory Section. We carried a paper by him, which was to have been read at the New Orleans meeting, in the October *Journal,* it having been requested in advance. He became a member of our Association in 1918 and a Fellow in 1923. He will be greatly missed by his associates of the Laboratory Section and members of our Association in general.

FREE HEALTH SURVEY

A FREE health survey will be granted to some one county or district, and some one city, entered and submitting a schedule in the 1936 Inter-Chamber Rural Health Conservation Contest.

Basis Upon Which Survey Will Be Granted—In order to be eligible for the Free Survey, a county or district, or a city, must submit a fact-finding schedule. The free survey will be granted not upon the score attained in the 1936 Contest but rather upon a combination of the following two factors: (1) The need of the community for a health survey, and (2) the opportunity and likelihood of the community making effective use of such a survey.

For further information write either the Insurance Department, Chamber of Commerce of the United States, Washington, D. C., or the Committee on Administrative Practice of the American Public Health Association.

SCIENTIFIC EXHIBITS AT NEW ORLEANS 1936

ALTHOUGH citations of merit were made for selected scientific exhibits at the Milwaukee meeting in 1935, this year at the New Orleans meeting certificates were conferred for the first time. Four exhibits were chosen by the judges for the award. Judges were: Dr. Guy S. Millberry, Dr. John L. Rice, and Dr. G. Foard McGinnes. The Committee on Scientific Exhibits has already expressed, publicly, its appreciation to the judges for their services in the difficult task with which they were charged. Their decisions were unanimous. To aid them the committee suggested 4 criteria for their guidance.

1. The effectiveness of the exhibit in *attracting attention.*
2. Its effectiveness in *holding attention* long enough to accomplish its purpose.
3. Its *clarity* in expressing its message.
4. Is the message worth while or *pertinent* for presentation to a group of *public health workers?*

In addition the judges were asked to make a brief statement to indicate why

each exhibit was selected. Their selections and statements were:

1. *The American Red Cross* exhibit on Pellagra, because it is wisely confined to a single subject and most attractively presented.
2. *National Society for the Prevention of Blindness,* for the concise, clear, and inexpensive presentation of its important motif.
3. *Sewerage and Water Board of New Orleans,* for a beautifully prepared representation of a local health facility.
4. *The Committee on Administrative Practice exhibit on Health Conservation Contests,* which, clearly expressing its purpose in cleverly worded legends, is limited to one subject eminently appropriate to the occasion.

A number of other exhibits received comment from the judges for particularly interesting items.

It was noteworthy that some exhibits were not entirely appropriate to a public health meeting, or which violated many of the accepted principles of a good exhibit, nevertheless attracted considerable attention from the delegates.

Also, it was specially gratifying to observe the large number of exhibits entered. The hearty thanks of the Association are due all exhibitors for their expenditures of time and effort toward making so creditable a contribution to the annual meeting.

BACK NUMBERS OF JOURNAL NEEDED

DUE to unusual demands for the following numbers of the *American Journal of Public Health*—

June, 1935
November, 1935
February, 1936

—the Executive Office of the A.P.H.A. has run out of stock on these issues and is in need of as many copies as are obtainable. It will be greatly appreciated if members who can spare these *Journals* will send them to headquarters.

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.

Health Officers Section

John A. Carter, M.D., 1301 Washtenaw Ave., Ann Arbor, Mich., Administrator, Clermont County Health Unit (taking course at University of Michigan)

Jose B. Castellanos, Valladolid 55 Bis., Mexico, D. F., Mex., State Health Officer, Veracruz

Julio Cesar Trevino, M.D., Ave. Hidalgo #41, Mexico, D. F., Mex., Chief, Quarantine Central Office, Department of Health

Sambola J. Couvillon, M.D., Moreauville, La., Member, State Board of Health

Walter M. Dickie, M.D., Ph.D., 8 Roble Court, Berkeley, Calif., State Director of Public Health

Thomas M. Fly, M.D., City Hall, Little Rock, Ark., City Health Officer

Alton A. Jenkins, M.D., 4371 Everett St., Oakland, Calif., District Health Officer, Utah (Post Graduate Student in Public Health, University of California)

Abraham I. Love, M.D., 4500 Elston Ave., Chicago, Ill., Health Officer, City Board of Health

Loran E. Orr, M.D., 1402 Washington Heights, Ann Arbor, Mich., District Health Superintendent, Illinois State Dept. of Public Health (taking public health course at University of Michigan)

Carl V. Reynolds, M.D., State Board of Health, Raleigh, N. C., State Health Officer

J. R. Ridlon, M.D., U. S. Marine Hospital, Galveston, Tex., Medical Officer in Charge

Gradie R. Rowntree, M.D., C.P.H., Hickman, Ky., Fulton County Health Officer

Emil A. Steiner, M.D., Somerset, Ky., Director, Pulaski County Health Dept.

J. Leland Tanner, M.D., M.P.H., Henderson, Ky., Director, Henderson County Health Dept.

Paul M. Thompson, M.D., Abbeville, Ala., Henry County Health Officer

Edward L. Van Aelstyn, M.D., 2331 Prince St., Berkeley, Calif., District Health Officer,

Utah (taking public health course at the University of California)

John W. Williams, M.D., C.P.H., City Hall, Asheville, N. C., City Health Officer

Benjamin F. Wyman, M.D., State Office Bldg., Columbia, S. C., Director, Rural Sanitation and County Health Work, State Board of Health

Laboratory Section

John X. Blender, 817 Arch St., Ann Arbor, Mich., Graduate Student, University of Michigan

Mattie Carter, State Hygienic Laboratory, Jackson, Miss., First Assistant Bacteriologist

William W. Cort, Ph.D., 615 N. Wolfe St., Baltimore, Md., Professor of Helminthology, School of Hygiene and Public Health

Mildred Davis, State Board of Health, Jackson, Miss., Bacteriologist, State Hygienic Laboratory

John M. Liptay, 37 Northern Blvd., Long Island City, N. Y., President, Laboratory Furniture Co., Inc.

Orin A. Ogilvie, M.D., 916 Military Drive, Salt Lake City, Utah, Teacher of Bacteriology, Pathology and Immunology, University of Utah

John P. Ransom, 608 Howard St., San Luis Obispo, Calif., Bacteriologist, San Luis Obispo County Health Dept.

Morris Ribner, 421 Flatbush Ave., Brooklyn, N. Y., Bacteriologist, Mt. Prospect Laboratory

Burton T. Simpson, M.D., 113 High, Buffalo, N. Y., Director, Division of Cancer Control, State Dept. of Health

George T. Stevens, U. S. Marine Hospital, San Francisco, Calif., Bacteriologist

Vital Statistics Section

Marjorie W. Amerine, 205 Lasseter St., Montgomery, Ala., Chief Tabulating Clerk, State Board of Health

Clifford H. Greve, 320 S. 7th St., Ann Arbor, Mich., Student

Public Health Engineering Section

Walter D. Bellamy, P. O. Box 301, Huntsville, Tex., District Sanitary Engineer, State Dept. of Health

Andrew T. Dempster, 9355 Wildemere Ave., Detroit, Mich., Assistant Sanitary Engineer, Dept. of Health

Wesley E. Gilbertson, State Dept. of Health, Bismarck, N. D., District Supervisor, Community Sanitation

Wilbert H. Grisham, Rm 105, Court House, Memphis, Tenn., Director, Division of Malaria-Mosquito Control, City Health Dept.

Albert Haneman, Jr., Box 476, Victoria, Tex., District Sanitary Engineer, State Dept. of Health

Chauncey A. Hyatt, Capitol Bldg., Springfield, Ill., Swimming Pool Sanitarian, State Dept. of Public Health

Paul F. Krueger, 707 City Hall, Chicago, Ill., Director, City Division, Bureau of Dairy Products, Board of Health

Harold Lesser, 118 N. Ingalls St., Ann Arbor, Mich., Student

Douglas L. Parker, 161 College St., Wilmington, O., Sanitarian, Clinton County

John B. Thomas, 1601 Ridge Rd., Catonsville, Md., Sanitary Engineer, Land Utilization Division, Resettlement Administration

William H. Weir, State Capitol Bldg., Atlanta, Ga., Assistant Chief, Division of Sanitary Engineering, State Dept. of Public Health

Cranston J. Wilcox, 223 S. State, Ann Arbor, Mich., Student

Industrial Hygiene Section

Theodore F. Hatch, 80 Centre St., New York, N. Y., Associate Dust Control Engineer, Division of Industrial Hygiene, State Dept. of Labor

Siegfried J. Nilson, M.D., D.D.S., 80 Maiden Lane, New York, N. Y., Medical Director, Fidelity and Casualty Co.

Oliver W. Welch, M.D., M.P.H., Tennessee Valley Authority, Wilson Dam, Ala., Associate Medical Officer, Industrial Hygiene

Food and Nutrition Section

Howell A. Smith, 800 West 21 St., Austin, Tex., Field Milk Supervisor, State Dept. of Health

Arthur H. Williamson, D.V.M., State Board of Health, Jacksonville, Fla., State Dairy Supervisor

Child Hygiene Section

Mildred A. Hesser, 117 N. State St., Ann Arbor, Mich., Student

Geneva S. Rothemund, M.D., 514 S. Wittenberg Ave., Springfield, O., Pediatrician, Bureau of Child Hygiene, State Dept. of Health

Lewis K. Sweet, M.D., Box 417, Tahlequah, Okla., Medical Officer, U. S. Children's Bureau

Virginia E. Webb, M.D., 313 New Court House, New Orleans, La., Acting Director, Red River Parish Health Administration

E. Bryant Woods, M.D., State Board of Health, Jacksonville, Fla., Director, Maternal and Child Health Bureau

Public Health Education Section

Etta G. Davis, R.N., C.P.H., 11321 Strathmoor, Detroit, Mich., Nurse Counsellor, Dept. of Health

James E. McCormick, M.D., 322 Clinton Ave., Newark, N. J., Assistant Director, Health Education

Leo H. Mynes, M.D., R.F.D. #3, Box 15, Charleston, W. Va., Medical Director, School Health Service, Kanawha County Schools

Public Health Nursing Section

Pauline Baker, 540 Packard St., Ann Arbor, Mich., Public Health Nurse, Madison County Board of Health (taking course at University of Michigan)

Agnes B. Bowe, 7556 Byron Place, Clayton, Mo., Director, Public Health Nursing Service, St. Louis County Health Dept.

Elsie M. Bowman, 1208 E. University, Ann. Arbor, Mich., Student Nurse

Florence H. Bunton, 6133 Fischer Ave., Detroit, Mich., Supervisor and Coördinator, Generalized Nursing Districts, Dept. of Health

Mildred Cardwell, R.D. #3 Lansing, Mich., Nurse, Ingham County Public Health Nursing Service

Georgie C. Clark, R.N., 416 Avon St., Flint, Mich., School Nurse, Board of Education

Jane D. Gavin, Court House, Durham, N. C., Supervising Nurse, Durham City and County Health Dept.

Hazel C. Holmes, R.N., 408 S. 4th Ave., Ann Arbor, Mich., Public Health Nurse (Student)

Helen F. Kramer, R.N., 755 E. University Ave., Ann Arbor, Mich., Public Health Nurse (Student)

Gladys F. Morehouse, 12703 Northlawn, Detroit, Mich., Special Supervisor, School Nurses

Matie V. Neely, R.N., 2614 West 15, Little Rock, Ark., Assistant State Nursing Supervisor, State Board of Health

Eva Pugh, R.N., P. O. Box 456, Danville, Va., Tuberculosis Field Nurse, State Board of Health

Elizabeth N. Rowland, 540 Packard St., Ann Arbor, Mich., Public Health Nurse, Washington Court House Board of Health (taking public health course at University of Michigan)

Margaret S. Vaughan, State Capitol, Little Rock, Ark., Supervisor, Public Health Nursing, State Board of Health

C. A. Wagner, El Paso Masonic Hospital, El Paso, Tex., Superintendent

Anastasia Wilson, R.N., 108 S. Broadway, Buhl, Idaho, School and County Nurse, Twin Falls County Health Unit

Bertha M. Winne, R.N., 517 E. Main, Marion, Va., Field Nurse, State Dept. of Health

Erma L. Wolfort, R.N., 6145 McPherson, St. Louis, Mo., County Health Counselor, St. Louis County Health Dept.

Epidemiology Section

James C. Boland, M.D., 228 Eighth St., Troy, N. Y., Epidemiologist-in-training, State Dept. of Health

James R. Enright, M.D., 409 Olohana St., Honolulu, T.H., Director, Bureau of Communicable Diseases, Board of Health

Ralph H. Heeren, M.D., Ph.D., 275 Medical Lab. Bldg., Iowa City, Ia., Assistant Professor of Hygiene and Preventive Medicine, University of Iowa Medical College

Ralph B. Snavely, M.D., Office of Indian Affairs, Dept. of the Interior, Washington, D. C., Commissioned Medical Officer, U. S. Public Health Service

Morris A. Stewart, Ph.D., University of California, Davis, Calif., Assistant Professor of Entomology

Glenn S. Usher, M.D., 1208 Tenth Ave. W., Seattle, Wash., Assistant Epidemiologist, State Dept. of Health

Unaffiliated

Ben A. Cohan, 1032 Church St., Ann Arbor, Mich., Student

Rufus Cole, M.D., D.Sc., 66 St. & York Ave., New York, N. Y., Member, Board of Scientific Directors, International Health Division, Rockefeller Foundation

Delia A. Lynch, M.D., 712 World Herold Bldg., Omaha, Nebr.

Edwin M. Mahoney, M.D., 630 Dwight St., Holyoke, Mass., Member, Board of Health

Dr. Felipe Malo Juvera, Alzate 83, Mexico, D. F., Mex., Chief of a Sanitary Brigade, Public Health Dept.

Clifton E. Merritt, M.D., 813 McKinley, Ann Arbor, Mich., Student

William B. Perry, Jr., M.D., 55 Shattuck St., Boston, Mass., Student

Edwin H. Place, M.D., 1608 Geddes, Ann Arbor, Mich., Student

Hanley E. Rosenberg, 1026 Vaughan, Ann Arbor, Mich., Student

Fannie B. Shaw, 50 W. 50 St., New York, N. Y., Secretary, School Health Association, National Tuberculosis Assn.

Milton L. Shurr, 1412 Geddes, Ann Arbor, Mich., Student

Vesta L. Stone, R.N., 12 Grove St., Fitchburg, Mass., Executive Secretary, N. Worcester County Public Health Assn.

Lars W. Switzer, M.D., Spruce St., Manistee, Mich.

Beatrice E. Tucker, 9 S. Michigan Ave., Chicago, Ill., Medical Director, Chicago Maternity Center

Echo D. Watson, Rm 230, State Bldg., Boise, Idaho, Secretary to Director of Public Health

DECEASED MEMBERS

Professor Edwin O. Jordan, Chicago, Ill., Elected Member 1899, Fellow 1922

Dr. Frank G. Atwood, New Haven, Conn., Elected Member 1920

Gordon Hastings, M.D., M.P.H., Little Rock, Ark., Elected Member 1934

Nicholas S. Hill, Jr., New York, N. Y., Elected Member 1910, Fellow 1922

J. C. Perry, M.D., San Francisco, Calif., Elected Member 1915, Fellow 1923

James M. Anders, Philadelphia, Pa., Elected Member 1933

Richard O. Beard, M.D., Minneapolis, Minn., Elected Member 1926

SOME OF THE PAPERS TO APPEAR IN THE JANUARY JOURNAL

The Efficiency of State and Local Laboratories in the Performance of Serodiagnostic Tests for Syphilis
Parran, Hazen, Sanford, Senear, Simpson, Vonderlehr

Newer Epidemiology of Yellow Fever
Soper

Public Health Features in Milk Plant Layout
Irwin

Recent Trends in Engineering Practice
Wolman

Housing as a Public Health Problem
Winslow

The Rôle of Vital Statistics in Medical Science
Walker

NEWS FROM THE FIELD

SOCIAL HYGIENE DAY

THE first National Social Hygiene Day will be held February 3, 1937, as announced by the American Social Hygiene Association, New York. On this day, state and community voluntary organizations interested in the control of syphilis and gonorrhea, and in other social hygiene problems, with the advice and approval of health authorities and the medical and allied professions, plan to hold meetings all over the United States.

The American Social Hygiene Association will hold its annual meeting on February 3 and the Social Hygiene Council of Greater New York will hold its Fifth Annual Regional Conference. It is expected that public leaders, including Surgeon General Parran, President Ray Lyman Wilbur, of Stanford University, President of the American Social Hygiene Association and former Secretary of the Interior, will speak at these meetings. National agencies and many of their state and community organizations which include social hygiene activities in their yearly programs are planning to participate. It is probable that a nation-wide radio hook-up will provide addresses of importance from government officials and civic leaders in different parts of the country as a climax to the activities of the First National Social Hygiene Day.

There has been definite progress all along the line during the past year in public understanding and support of the campaign against syphilis. Newspapers and magazines are opening their columns to public discussion of this health menace to a greater extent than ever before.

It is believed that the direction of united nation-wide attention to this subject in the way that is proposed will help professional and lay community leaders to capitalize and increase this new interest, and consolidate for further advances toward meeting Dr. Parran's challenge to " stamp out syphilis."

FLORIDA TUBERCULOSIS BUREAU

THE Florida State Department of Health has established a Tuberculosis Bureau, with Dr. Arthur J. Logie, of Chattahoochee, as Director. One of the first activities of the Bureau will be a survey to determine the need for clinics throughout the counties.

A mobile laboratory will be operated in sections not cared for by county health units.

KANSAS VENEREAL DISEASE COMMITTEE

THE Kansas Medical Society will appoint a committee on venereal diseases to act in an advisory capacity to the State Board of Health in the development and execution of programs throughout Kansas.

This action followed a conference between representatives of the State Board of Health and the state medical society.

MICHIGAN BUREAU OF INDUSTRIAL HYGIENE

A BUREAU of Industrial Hygiene has been created in the Michigan Department of Health, with John M. Hepler, C.E.,† of Lansing, Mich., as Director.

A preliminary survey of plant conditions to determine the scope of existing industrial hazards, the location of

† Member A.P.H.A.

potential hazards, and to evaluate the need for preventive measures is being undertaken by the Bureau. One phase of the program will be the collection and analysis of case records of industrial diseases.

PERSONALS

ELDRED K. MUSSON, M.D.,* of Jefferson City, Mo., has resigned as Director of the division of communicable disease control of the Missouri State Department of Health. He will be appointed to a similar position with the Kansas Board of Health.

HARRY E. JORDAN,* of Indianapolis, Ind., assumes his duties as Executive Secretary of the American Water Works Association on Dec. 1. Mr. Jordan has been identified for many years with the Indianapolis Water Company. He is succeeded by Cecil K. Calvert, B.S.,† of Indianapolis.

DR. NORRIS T. OWEN, of Rapid City, S. Dak., was recently named President of the South Dakota State Board of Health. Dr. Carl A. Feige, of Canova, is Vice-President, and Dr. Burt A. Dyar,† of Pierce, is Director of Medical Licensure. Dr. Park B. Jenkins † is Secretary.

EMIL A. STEINER, M.D.,† of Cleveland, Ohio, has been appointed Health Officer of Pulaski County, with offices in Somerset, Ky.

JULIAN O. LONG, M.D.,† of Baltimore, Md., has been provisionally appointed to succeed Dr. James R. Scott * as Health Officer of the Third District of Albuquerque, N. M., resigned.

EDGAR MAYER, M.D.,† and James Burns Amberson, Jr., M.D., have been appointed by the State Industrial Commissioner of New York as Consultants on Dust Diseases.

DR. JACK B. PORTERFIELD, Christiansburgh, Va., has been appointed Health Officer of the peninsula district, to succeed Dr. George E. Waters, Williamsburgh, resigned. Dr. Sheldon D. Carey, recently of Abingdon, Va., has been named to succeed Dr. Porterfield as Health Officer of Montgomery County.

DR. WILDER G. PENFIELD, Professor of Neurology and Neurological Surgery, McGill University Faculty of Medicine, Montreal, delivered the first Harvey Lecture of the season on October 15 at the New York Academy of Medicine.

DR. GEORGE K. PRATT, since 1930 Medical Director of the Mental Hygiene Committee of the New York State Charities Aid Association, has been appointed to a similar position with the Connecticut Society for Mental Hygiene. He succeeds Dr. Edgar Van Norman Emery, who has been appointed Professor of Social Psychiatry at Washington University School of Medicine, St. Louis, Mo.

LLOYD B. SHEFFIELD, M.D.,† has been appointed Health Director of the Dallas public school system, succeeding Edythe P. Hershey, M.D.,† of Austin, resigned. Dr. Sheffield has been Assistant Health Director for 5 years.

DR. HAROLD DOUGLAS SINGER, Head of the Department of Psychiatry, University of Illinois College of Medicine, has been put in charge of work to promote undergraduate instruction in psychiatry in the university. The Rockefeller Foundation has granted the university a fund of $15,000 a year for 3 years for this purpose.

DR. JESSE M. DISHMAN, Greensburg, Ky., Health Officer of Green County, has been appointed Health Officer of Caldwell County, to succeed Dr. B. Kirtley Amos, resigned.

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* Fellow A.P.H.A.
† Member A.P.H.A.

LORENZO L. PARKS, M.D.,† Health Officer of Tarboro, N. C., has been appointed Secretary of the Health Conservation Committee which has been organized in Edgecombe County.

J. CLARENCE FUNK, A.B., Sc.D., LL.B.,* formerly of the Pennsylvania State Department of Health, Harrisburg, and more recently with the U. S. Public Health Service, Washington, D. C., has been placed in charge of the educational work of the Virginia State Department of Health.

ALFRED D. GREGG, M.D.,† of Liberty, N. C., has been appointed Health Officer of Vance County, succeeding Zack P. Mitchell, M.D.,† of Henderson, who has been appointed Health Officer of Swain and Graham Counties.

DR. ROBERT M. TAYLOR has been appointed Health Officer of East Haven, Conn., succeeding Paul H. Brown, M.D.†

GARNER M. BYINGTON, M.D.,† of Battle Creek, Mich., for 4 years Medical Director of the W. K. Kellogg Foundation, has resigned to become Director of Medical Relations in the Detroit Department of Health. Dr. Byington will have supervision of the program which attempts to link up the practicing physician with all phases of preventive medicine. He will also supervise the program for medical education.

ABRAM L. VAN HORN, M.D.,† Chief of the Bureau of Child Hygiene of the Ohio State Department of Health since 1934, has been appointed a regional consultant for the Children's Bureau, U. S. Department of Labor. Dr. Van Horn will supervise the maternal and child health program of the Bureau in Maryland, Delaware, District of Columbia, Virginia, North and South Carolina, Georgia, and Florida.

JOHN M. HEPLER, C.E.,† of Lansing, Mich., is the Director of the newly created Bureau of Industrial Hygiene of the Michigan Department of Health.

DR. GORDON E. SAVAGE,† of Osborn, Ohio, has been appointed Health Officer of Greene County. The position has been heretofore half time.

DR. REXFORD A. BURDETTE, of Charleston, W. Va., has been named Director of the Monongalia County Health Department, succeeding Robert C. Farrier, M.D.,† who recently resigned to accept a similar position in Delta County, Mich.

DR. KURT C. BECKER, of Toledo, Ohio, has been appointed District Health Officer, with offices at Royal Oak, Mich., succeeding Charles H. P. G. Benning, M.D., C.P.H.,* who has become Director of Health of Schools of Peoria, Ill.

DR. GEORGE E. COGAN has been elected President of the Hartford Board of Health, succeeding Dr. Robert V. Boyce, resigned.

DR. JAMES W. MILLER, recently Health Officer of Gallatin County, Ky., has been transferred to Green County, to succeed Dr. Jesse M. Dishman, of Greensburg, recently appointed in Caldwell County.

DR. JAMES O. NALL, recently of Murray, Ky., has been appointed Health Officer of Trigg County.

DR. PAUL C. BRATTEN, of New Bremen, Ohio, has been appointed Health Officer of Shelby County, to succeed the late Alfred B. Lippert, of Sidney.

DR. ROBERT J. ROWE, of Kaufman, Tex., has been appointed a member of the State Board of Health of Texas, to succeed Dr. George W. Cox, of Del Rio, resigned.

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* Fellow A.P.H.A.
† Member A.P.H.A.

A. ELIZABETH INGRAHAM,* M.D., since 1923 Director of the Bureau of Child Hygiene of the Connecticut State Department of Health, Hartford, Conn., has resigned, effective January 1.

EVA MOORE ADAMS,† of Jackson, Miss., has been appointed Supervisor of Health Education, a newly created position in the Mississippi State Board of Health.

DR. I. HOPE ALEXANDER was appointed director of the Department of Public Health, Pittsburgh, Pa., on November 14, succeeding Ray P. Moyer, M.D.†

DR. ERNEST L. GATES, Greenville, Ky., has been appointed a member of the State Board of Health.

DR. DAVID L. WILLIAMS, of Bedford, Mass., has been appointed State Commissioner of Mental Diseases, to succeed Dr. Winfred Overholser.

DR. OSCAR D. GARVIN, JR., of Ridge Springs, S. C., has been appointed Health Director of the district including the counties of McCormick, Edgefield, and Saluda.

DR. JAMES A. STUMBO, of Charleston, S. C., has been appointed Health Officer of a new health unit in Union County.

DR. HAROLD T. OESAU has been named Acting Health Officer of Stratford, Conn., succeeding the late Dr. DeRuyter Howland.

DR. FRANK M. DUNN, of New London, Conn., has been appointed Health Officer of Waterford, to succeed the late Dr. Ross E. Black.

DR. BRYAN J. CARDER, Deputy Health Commissioner of Berwyn township for the past 3 years, has been appointed Commissioner to fill the unexpired term of the late Edward J. Farrell, M.D.† of Berwyn, Ill.

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* Fellow A.P.H.A.
† Member A.P.H.A.

DEATHS

WILLIAM BUCHANAN WHERRY, M.D.,† of Cincinnati, Ohio, died November 1, at the age of 61.

THOMAS F. O'BRIEN, M.D.,† formerly Acting Health Officer of Hartford, Conn., died November 30, at the age of 52.

WILLARD P. GREENE, M.D.,* of Minneapolis, died November 25. He was Senior Epidemiologist in the Division of Preventable Diseases, Minnesota State Department of Health.

C. DUNCAN, M.D.,* of Concord, N. H., State Health Officer of New Hampshire, died November 12.

CONFERENCES AND DATES

American Association for the Advancement of Science. Atlantic City, N. J. Dec. 28–Jan. 1.

American Association of School Physicians—Regional Meeting with the Second National Conference on College Hygiene. Wardman Park Hotel, Washington, D. C. Dec. 28–31.

American Society of Heating and Ventilating Engineers, 43rd Annual Meeting. Hotel Statler, St. Louis, Mo. Jan. 25–27.

American Society of Parasitologists. Atlantic City, N. J. Dec. 29–31.

Association of Dairy, Food and Drug Officials of the United States. Miami Biltmore Hotel, Coral Gables, Fla. Dec. 7–10.

Connecticut Public Health Association. Waterbury, Conn. Dec. 16.

Educational Broadcasting, First National Conference — under auspices of the U. S. Office of Education and Federal Communications Commission. Mayflower Hotel, Washington, D. C. Dec. 10–12.

Florida Public Health Association. Tampa, Fla. Dec. 7–9.

Illinois Health Officers and Public

Special Announcement

An American Doctor's Odyssey

Autographed by the author,

DR. VICTOR HEISER

You know, of course, of the sensational reception accorded to this book.

It heads the list of best-sellers in the non-fiction class. It is definitely *not* fiction, but a gripping, thrilling, true story of a life lived in the interest of public health and preventive medicine.

Few men have the privilege of serving a high cause and at the same time crowding that service with adventure. Fewer still possess the gift of telling the story. Dr. Heiser is one of the elect.

Through his courtesy, and in answer to the importunities of his friends, the Book Service has the honor to announce a limited number of copies of the "Odyssey," autographed by Dr. Heiser, for sale at the publisher's price, $3.50.

This is the answer to that troublesome gift problem. Give an autographed copy of "An American Doctor's Odyssey." But place your orders at once!

▼

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American Public Health Association

50 West 50th Street
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N.B. The *New York Times* says: "What a career! A boldness, a fascination and a lift that no lifetime spent in retail curing could have."

Health Nurses. Auditorium, Springfield, Ill. Dec. 8–9.

Massachusetts Public Health Association. Boston, Mass. Jan. 28.

National Conference on College Hygiene. Wardman Park Hotel, Washington, D. C. Dec. 28–31.

National Society for the Prevention of Blindness. Columbus, Ohio. Dec. 3–5.

New Jersey Conference of Social Work. Asbury Park, N. J. Dec. 3–5.

Public Health Association of New York City. First Scientific Meeting. George Washington Hotel, New York, N. Y. Dec. 3.

Society of American Bacteriologists. Indianapolis, Ind. Dec. 28–30.

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